

ANNALS

OF THE

ROYAL BOTANIC GARDEN, CALCUTTA.

Vol. X.

PART I.

THE SPECIES OF DALBERGIA OF SOUTH-EASTERN ASIA.

By
D. PRAIN,
Superintendent of the Royal Botanic Garden, Calcutta.



CALCUTTA:
Bengal Secretariat Press.

1904.

PRICE—in Indian money, Rs. 22; in English money, £1-13.

Published at the BENGAL SECRETARIAT BOOK DEPÔT,
Writers' Buildings, Calcutta.

—◆—
OFFICIAL AGENTS.

In India—

MESSES. THACKEB, SPINK & Co., Calcutta and Simla.
MEBSBS. NEWMAN & Co., Calcutta.
MESSES. HIOOINBOTHAM & Co., Madras.
MESSES. THACKER & Co., LD., Bombay.
MESSES. A. J. COMBBIDGE & Co., Bombay.
THE SUPERINTENDENT, AMEEICAN BAPTIST MISSION PBESS, Rangoon.
MBS. RADHABAI ATMAEAM SAGOON, Bombay.
MESSES. R. CAMBEAY & Co., Calcutta.
MESSES. S. K. LAHIEI & Co., Printers and Booksellers, College Street,
Calcutta.
RAI SAHIB M. GULAB SINGH & SONS, Proprietors of the Mufid-i-am Press,
Lahore, Punjab.
MESSES. V. KALTANAEAMA TYEB & Co., Booksellers, &c, Madras.
MESSES. D. B. TAEAPOEEVALA, SONS & Co., Booksellers, Bombay.
MESSES. G. A. NATESON & Co., Madras.
MR. N. B. MATHUE, Superintendent, Nazair Kanum Hind Press, Allahabad.
THB CALCUTTA SCHOOL BOOK SOCIETY.

In England—

ME. E. A. AENOLD, 37 Bedford Street, Strand, London.
MESSES. CONSTABLE & Co., 2 Whitehall Gardens, London.
MESSES. SAMPSON LOW, MAESTON & Co., St. Dunstan's House, Fetter Lane,
London.
MESSBS. LUZAC & Co., 46 Great Russell Street, London.
MESSES. KEGAN PAUL, TRENCH, TEÜBNEB & Co., Charing Cross Road, London.
MB. B. ALFRED QUAEITCH, 16 Piccadilly, London.
MESSES. P. S. KING & SON, 2 Si 4 Great Smith Street, Westminster, London.
MESSES. H. S. KING & Co., 65 Cornhill, London.
MESSES. WILLIAMS AND NOBGATE, Oxford.
MBSSES. DEIGHTON BELL & Co., Cambridge.

On the Continent—

MESSES. R. FBIEDLANDEB & SOHN, Berlin, N. W., Carlstrasse, 11.
ME. OTTO HABBASSOWITZ, Leipzig.
MB. KAEL HIEESEMANN, Leipzig.
MB. EENEST LEBOUX, 28 Rue Bonaparte, Paris.
MB. MABTINUS NIJHOFF, The Hague.

THE,
SPECIES OF DALBERGIA OF SOUTH-EASTERN ASIA.

By
D. PRAIN,
Superintendent of the Royal Botanic Garden, Calcutta.

WITH NINETY-ONE PLATES.

CALCUTTA:
Bengal Secretariat Press.
1904.

ANNALS

OF THE

ROYAL SOLIANIO & SOEHN, OALOU I ;



Vol. X, Part I.



PREFACE.

THIS paper provides descriptions and figures of the Asiatic *Dalbergias*. The genus *Dalbergia* is economically important: it includes not a few trees which yield esteemed timbers. It is also taxonomically difficult; generally, since it does not lend itself readily to natural subdivision, and in detail, because its species are hard to delimit. Some of the difficulties are accidental, occasionally perhaps subjective; many, however, are real.

In works published between 1781, when the genus was proposed by the younger Linnaeus, and 1851, when Bentham first methodically subdivided it, misconceptions as to its natural limits so vitiate the accounts of *Dalbergia* as to make it uncertain whether individual species really belong. Since 1851, thanks entirely to Bentham's satisfactory characterisation, the number of species referred to the genus that are not *Dalbergias* has been small. Difficulties as to species have not, however, diminished in the same way. Partly from the recognition as distinct of forms that prove on examination to belong to already established species, partly because *Dalbergias* from China, Indo-China, Malaya, and Papuasia have in local treatises been referred too hastily to recognised Indian ones, it is uncertain, in any work published between 1851 and 1901, that particular species, reported from regions other than their *loci classici*, are entitled to the specific epithets applied.

This state of affairs was first appreciated by the writer when, in 1896, at the request of SIR GEORGE KING, he undertook to arrange the Malayan material of the genus preserved in the Calcutta Herbarium. Two articles in the *Journal of the Asiatic Society of Bengal* for 1897, which were the outcome of this study, invite comparison with similar articles by Miquel in 1855, by Kurz in 1876, and by Baker in the same year. The account of the Indian species by Baker, in the *Flora of British India*, was written with all the benefit of reference to the writings of Miquel, of Bentham, and of Kurz, and all the advantage of access to fuller suites of material than were at their disposal: it therefore throws much light on points that to Miquel and to Kurz were obscure. It is to be hoped that the writer's articles, prepared with corresponding advantages, throw some light on points that were obscure to Baker. But it is not unusual, in studies of the kind, to find that as one doubt disappears another arises: the results of 1897 were therefore published with the feeling that they leave as much to be desired as do the contributions of Miquel, of Kurz, and of Baker.

The two pitfalls of taxonomy have been incidentally mentioned. The multiplication of forms among the Asiatic *Dalbergias*—some 110 names have been employed

for 8G actual species—has in many cases been due to original definitions that are inadequate, or at any fkte imperfect. This undue recognition of species, though unfortunate, has thus been largely accidental. But excessive differentiation, though troublesome to the general systematist and, from its tendency to exaggerate his inferences, vexatious to the student of distribution, is a fault that, in spite of the strictures to which it is subjected, causes comparatively little inconvenience. If error be, as in human affairs it often is, unavoidable, it is in this direction that, in regional treatises, it is safer to err. For purely local needs it is indeed at times advisable, in the interests of lucidity, to treat as a species a form that the monographer can only admit as a variety. Even when, in more general treatises, two really conspecific forms are kept apart, the intelligent layman is willing to believe that some distinction exists which is not apparent to the untrained eye. The harm done by excessive integration, which some authors consider a virtue, though oftener overlooked, is so much greater that it can hardly be overstated. Here the laity criticise less leniently, and when two forms that, to the observer in the field, are obviously distinct have been authoritatively united in the herbarium, the damage done to the science which field- and cabinet-worker alike desire to advance is incalculable. The subjective effect of the habit is equally detrimental; habit becomes second nature, and at times the reducer hides, under the cloak of a specious erudition, work that is unsound. The indirect results of unbalanced reduction, even when applied in good faith, are more damaging still. The maker of invalid species as a rule only exaggerates actual facts ; the geographical botanist is usually able to discount this exaggeration by a simple arithmetical process. Unconsidered identification, on the other hand, obscures the facts of distribution and evades computation; it is, besides, too often a cause of offence on the part of those weaker brethren who prefer the statement of a text to the harvest of the eye. But it is in the domain of applied science, whereof taxonomy is at once the mistress and the handmaid, that the evils of undue integration are most patent; only those whose duty it is to deal with economic problems can fully appreciate the confusion that may result when the same name is applied to two, or three, or more distinct forms, or adequately realise the reproach to taxonomy that the custom involves.

The economic importance of the genus *Balbergia* rendering it desirable to put an end to the doubts that prevailed as to the identity and distribution of its Asiatic species, a study has been undertaken of the material preserved in a number of important collections. The herbaria consulted have been—in Asia, those of Calcutta, Buitenzorg, Hong-Kong, Saharanpur, Peradeniya: in England, those of Kew, the British Museum, and the Einnean Society: in France, those of the Jardin des Plantes, of Mm. Drake del Castillo and E. Pierre: in Germany, that of the Eoyal Herbarium, Berlin: in Switzerland, those of Mm. de Candolle and Barbey-Boissier : in Holland, that of Eeiden : in Italy, that of Signor Beccari. For the kindness with which they have afforded the writer opportunities of increasing his knowledge of this difficult genus, he is under deep obligations to Dr. TREUB, Mr. FORD, Mr. DUTHIE,

Mr. WILLIS ; to Sir W. T. THISELTON-DYER, Mr. MURRAY, and the staffs of Kew and the British Museum ; to M. BUREAU, M. DRAKE DEL CASTILLO, M. PIERRE, and the late M. FRANCHET ; to M. C. DE CANDOLLE and Mr. BARBEY ; to Professor ENGLER ; to the late Professor SURINGAR, and to Signor BECCARI. Mr. BAILEY has kindly contributed specimens of the only *Balbergia* in the Brisbane Herbarium; Dr. VAN EOMBURGU and Dr. KOORDERS have equally kindly helped in clearing up difficulties connected with the species of Celebes; Dr. J. V. SURINGAR of Leiden, Messrs. W. B. HEMSLEY and E. G. BAKER of London, and Dr. HARMS of Berlin have given kind and ready help in clearing up difficulties of a bibliographical nature. To all these friends the writer wishes to tender his warm thanks.

The descriptions now given are as full and the figures are as complete as the material available has made it possible to provide. The general system of arrangement adopted is one that the writer finds to be more convenient and believes to be less unnatural than any system hitherto proposed. A conspectus of the system precedes the descriptive section, and is itself preceded by a review of its evolution and by a sketch of the distribution of the Asiatic species. The main object, however, is the delimitation of the species, and an attempt has been made, doubtless with incomplete success, to steer a middle course between the shoalwaters of over-differentiation and the whirlpools of excessive integration. In not a few instances, as will be seen, complete material of certain forms is wanting: while the defects, in several cases, leave us still in doubt as to the natural position, it is hoped that they do not leave us in doubt as to the validity of the species concerned. An ideal, because complete, knowledge of our Asiatic *Balbergias* is still a long way off, but the best means of attaining this knowledge is to provoke further research by indicating the points that are still in debate. To *tills* end it seems therefore advisable to make available, here and now, all the information regarding this genus that the writer, during seven years of enquiry, has been able to collect.

CALCUTTA ;

5th April 1903.

CONTENTS.

PART I.—INTRODUCTION.

	PAGE.
§ 1. HISTORICAL REVIEW OF THE DELIMITATION OF THE GENUS DALBERGIA:—Linneus the younger, Lamarck, Roxburgh, Willdenow, Persoon, Poiret, Dennstedt, Roth, Blume, De Candolle, Sprengel, G. Doc, Wallich, Wight and Walker-Arnott, Graham	1
§ 2. SKETCH OF THE ATTEMPTS TO CLASSIFY THE SPECIES OF DALBERGIA:—System adopted by Wight and Walker-Arnott in 1834; system proposed by Bentham in 1851 and adopted by Miquel in 1855; modifications introduced by Bentham in 1860; the advantages and disadvantages of Bentham's method; modifications of the Benthamian system in 1876 by Kurz and by Baker; system adopted by Taubert in 1894; review of all the preceding systems; explanation of the method of arrangement adopted in the present work	5
§ 3. THE VALIDITY OF THE GENERIC NAME DALBERGIA:—Names for the genus more recent than the name <i>Dalbergia</i> ; names with priority as to date cited as equivalent; <i>Salken</i> and <i>Solori</i> not homonyms of <i>Dalbergia</i> ; <i>Acouroa</i> ^ <i>Pterocarpus</i> , <i>Ecadaphyllum</i> , <i>Amerimnon</i> only partially synonymous; <i>Dalbergia</i> the one name that covers the whole ground	10
§ 4. DISTRIBUTION OF THE ASIATIC SPECIES OF DALBERGIA:—Outlying districts,—Melanesia, Micronesia, Australia, Ceylon, India Deserta; botanical provinces,—India, Indo-China, China, Malaya, Papuasias; botanical subareas; reasons for annexing Tongking to China and for uniting the Taping Valley to Indo-China; Chinese subareas,—South-Western, Central and Eastern; Papuasian subareas,—the Philippines, New Guinea, the Moluccas, Celebes; Malayan subareas,—Borneo, the Malay Peninsula, Sumatra, Java; Indian subareas,—Malabar, Coromandel, Himalaya; reasons for subdividing the Himalayan region; Indo-Chinese subareas,—Western Indo-China, Central Indo-China, Eastern Indo-China; advantages of removing South-Western China from China and Western Indo-China from Indo-China, and of treating the two along with the Himalaya; obviously natural areas,—Eastern China, India with South-Western China and Indo-China, Malaya with Papuasias; details of specific distribution; distribution by sections; localised and widespread species contrasted	11

PART II.—CONSPECTUS SYSTEMATICUS.

DALBERGIA;

I.—SISSOA;

§ 1. *Triptokmea*;

If 1- Nummularieae;

1 2. Parviflorae;

If 3. Discolor;

If 4. Eimosae;

% 5. Phyllanthoides;

If 6. Mimosoides. 26

CONTENTS.

	PAGE.
§ 2. <i>Podiopetalum</i> ;	
If 7. Foliaceae;	
If 8. Cultrate ;	
If 9. Sissoo.	27
II.—AMERIMNON ;	
^ 3. <i>Endespermum</i> ;	
If 10. Eostrate;	
If 11. Rubiginosae;	
If 12. Menoëides;	
If 13. Congest@;	
If 14. Polyphyllse.	28
i 4. <i>Miscolohum</i> ;	
If 15. Velutinoe ;	
If 10. Ovate;	
If 17. Latifoliae;	
If 18. Polyadelphe	%)
i •). <i>Dalbergaria</i> ;	
If 19. SericG^e;	
If 20. Laaceolarieae;	
If 21. Cam@;	
If 22. Volubilis;	
If 23. Stipulaceae;	
If 24. Keniformes.	29

• PART III.—DESCRIPTIONS OF THE ASIATIC SPECIES OF DALBERGIA.

Subgenus		PAGE.
I.—SI-SOA :—		
^ Triptolomea: <i>D. Albertisii, Beccarii, Cumingiana, parviflora, spinosa, discolor, rimosa, Forbesii, Thomsoni, Junghuhnii, Scortechinii, Curtisii, stercoracea, Mimosella, multiflora, phyllanthoides, coromandeliana, nielanoxydon, Malletii, Htenophylla, mimosoides.</i>		32
§ JPodiopetalum : <i>D. Hancei, Dyeriana, confertiflora, yunnanensis, Collettii, foliacea ; cidal, fnsca ; Sissoo.</i>		50
Subgenus II. — AMERIMNON :—		
?j Endespermum: <i>D. Hullettii, Havilandi, rostrata, ITingiana, Henryana, Benthami, ruginosa ; menoëides, torta ; congesta, Gardneriana, Honeana, malabarica ; acaciaefolia, tamarindifolia, polyphylla, Jahsrii, burmanica, Pierreana, densa.</i>		59
8 MisDolobium: <i>D. vclufiana, boniëensis, obtusifolia, ghmeriflora, ovata, cambodiana, tonkinensis ; latifolia, sissooides, cochinchinensis ; polyadelphe.</i>		74
3 Dalbergaria: <i>Z. sencea, sacerdotum ; paniculata, hypoleuca, assamica, Balansae, Uinahassae, szemaënsis, Oliveri, lanceolaria, Hemsleyi, Wottii, mammosa, bariëmis, dongnaiëmis, Duperreana, Kurzii, cana ; volubilis ; ferruginea, stipulacea ; Godefroyi, falcata, Kunstleri, reniformis.</i>		85
Doubtful and excluded species.		107
INDEX.		111

LIST OF PLATES.

PLATE		PAGE.
	1, Disposition of the Asiatic groups of species of DALBERGIA ; to face . . .	9
”	2. DALBERGIA in the sub-subareas of South-Eafet Asia ; to face.	22
99	3. DALBERGIA in the provinces and eubareas of South-East Asia ; to face . . .	23
95	4. Distribution of Asiatic species of DALBERGIA ; to face.	24
95	5. Dalbergia Albertisii <i>Prain</i> .	
15	6. A. D. Beccarii <i>Prain</i> ; B. D. glomeriflora <i>Kur%</i> .	
55	7. D. Cumingiana <i>Benth</i> ,	
”	8. D. parviflora <i>Roxb</i> .	
”	9. D. spinosa <i>Roxb</i> .	
”	10. D. discolor <i>BL</i>	
99	11. D. rimosa <i>Roxb</i> .	
..	12. D. Forbesii <i>Prain</i> .	
77	13. D. Thomsoni <i>Benth</i> .	
91	14. D. Junghuhnii <i>Benth</i> .	
59	15. D. Scorteohinii <i>Prain</i> .	
75	16. D. Curtisii <i>Prain</i> .	
95	17. D. stercoracea <i>Maing</i> .	
55	18. D. multiflora <i>Heyne</i> .	
99	19. D. phyllanthoides <i>BL</i>	
”	20. D. phyllaethoides <i>Bl</i> VAR. <i>sennoides Prain</i> .	
”	21. D. coromandeliana <i>Prain</i> .	
..	22. D. melanoxylon <i>Outli</i> . <^ <i>Perr</i> .	
69	23. D. Millettii <i>Benth</i> .	
55	24. D. etenophylla <i>Prain</i> .	
55	25. D. mimosoides <i>Franch</i> .	
77	26. D. Hancei <i>Benth</i> .	
75	27. D. Dyeriana <i>Prain</i> .	
..	28. D. confertiflora <i>Benth</i> .	
35	29. D. yunnanensis <i>Franch</i> .	
94	30. D. Collettii <i>Prain</i> ,	
”	31. D. foliacea <i>Wall</i> .	
”	32. D. cultrata <i>Grah</i> .	
95	33. D. fusca <i>Pierre</i> .	
”	34. D. Sissoo <i>Roxb</i> .	
59	35. A. D. Hullettii <i>Prain</i> ; B. D. Hayilandi <i>Prain</i> .	
”	36. D. rostrata <i>Grah</i> .	
59	37. D. Kingiana <i>Qrah</i> .	
”	33. D. Henry ana <i>Prain</i> .	
”	39. D. Benthami <i>Prain</i> .	
97	40. D. rubiginosa <i>JBca-i</i> .	
97	41. D. menoeides <i>Prain</i> .	
95	42. D. torta <i>Gr^A</i> .	
55	43. D. congesta <i>Or ah</i> ,	
59	44. D. Gardneriana <i>Benth</i> .	
57	45. D. Hoseana <i>Prain</i> .	
75	46. D. malabariora <i>Prain</i> .	
77	47. D. acaciaefolia <i>Dal%</i> .	
95	48. D. tatnarindifolia <i>Roxb</i> .	
55	49. D. polyphylla <i>Benth</i> .	
”	50. D. Jaherii <i>Buerck</i> .	

- PLATE 51. *Dalbergia burmanica* *Prain*.
 „ 52. *D. Pierreana* *Prain*,
 „ 53. *D. densa* *Benth.*
 „ 54. *D. densa* *Benth.* VAR. *australis* *Prain*.
 „ 55. *D. velutina* *Benth.*
 „ 56. *D.* velutina* *Benth.* VAR. *Maingayi* *Prain*.
 „ 57. *D. borniënsis* *Prain*.
 „ 58. *D. obtusifolia* *Prain*.
 „ 59. *D. ovata* *Prain*.
 „ 60. *D. cambodiana* *Pierre*.
 „ 61. *D. toukineDsis* *Praia*.
 „ 62. *D. latifolia* 2^6.
 „ 63. *D. sissoides* *Grah.*
 „ 64. *D. cochinchinensis* *Pierre*.
 „ 65. *D. polyadelpa* *Prain*.
 „ 66. *D. sericea* (? 7)^«.
 „ 67. *D. sacerdotum* *Prain*.
 „ 68. *D. paniculata* 72o^6,
 „ 69. *D. paniculata* ite^ . VAR. *säigonensis* *Pierre*.
 „ 70. *D. hupeana* *Hance*.
 „ 71. *D. assamica* *Benth.*
 „ 72. *D. Balansae* *Prain*.
 „ 73. *D. Miaahassae* *Koord*.
 „ 74. *D. szemaoensis* *Praia*.
 „ 75. *D. Oliveri* *Gamble*.
 „ 76. *D. lanceolaria* *Lhni. f.*
 „ 77. *D. Hemsleyi* *Prain*.
 „ 78. *D. Wattii* *C/r?rfe*.
 „ 79. *D. mammoea* *Pierre*.
 „ 80. *D. bariensis* *Pierre*.
 „ 81. *D. dongnaiensis* *Pierre*.
 „ 82. *D. Duperreana* *Pierre*.
 „ 83. *D. Kurzii* *Prain*.
 „ 84. *D. cana* *Grah.*
 „ 85. *D. volubilis* *Roxb.*
 „ 86. *D. ferruginea* *Roxb.*
 „ 87. *D. stipulacea* *Roxb.*
 „ 88. *D. Godefroyi* *Prain*.
 „ 89. *D. falcata* *Prain*.
 „ 90. *D. Kunstleri* *Prain*.
 „ 91. *D. reniformis* *Roxb.*

[PLATES 5—91 to follow letter-prsss.]

THE
SPECIES OF DALBERGIA
OF
SOUTH-EASTERN ASIA.

I.-INTRODUCTION.

§ 1. *Historical Review of the Delimitation of the genus Dalbergia.*

THE name *Dalbergia* was proposed in 1781 by the younger Linnaeus,* in memory of Charles Gustavus and of Nicholas Dalberg, two Swedish botanists connected with Surinam, in order to accommodate two species, one a tree from Ceylon which he named *D. lanceolaria*, the other a shrub from Surinam, which he termed *D. Monetaria*. Lamarck in 1790^f dealt with the same two species, taking however the opportunity of invalidating the genus by adding, as a variety of *D. lanceolaria*, a plant figured by Rheede in 1686,^J for which in 1703 Adanson[§] had proposed the generic name *Solori*. The effects of this error have been far-reaching, and have been perpetuated in works so authoritative and so recent as the *Index Kewensis* of Hooker and Jackson, and as the *Revisio* of Dr. O. Kuntzo.

To the genus in 1798 Roxburgh^{!]} added three new species, *D. latifolia*, *D. paniculata*, and *D. rubiginosa*; all Indian, and all species that have stood the test of further examination, whether as regards their generic position or their specific rank. Willdenow, who in 1800[^] again took the genus in hand, added two more species to those of Linnaeus and Roxburgh. His two additions were, however, somewhat unfortunate; one of them, *Z. heterophylla*, is in reality *Derris uliginosa*; the other, *D. arborca*, is the tree on which Adanson in 1763** had based his genus *Pongam*, a name modified by Lamarck in 1797^{ft} to *Punjamh* and by Ventenat in 1803^J to *Pongamia*; the last-mentioned name is that now generally employed to designate it. When in 1806 Persoon^{§§} collated the species known to him, he corrected the latter error; the former, however, escaped his notice, and it happens that he deals with the same species in two different places, naming it in one *Dalbergia heterophylla*, in the other *Derris triphylla*. Two more species were added in the *Synopsis*; these are quite as unfortunate as the additions made by Willdenow; one of them, *D. dominicensis*, is really a *Lonchocarpus*; the other, *D. Diphaca*, is an *Ormocarpum*. The most important feature of Persoon's digest is the transfer there, by Richard, of *D. Monetaria* to the genus *Ecastaphyllum*. Poirot, dealing with the genus in 1811, speaks of the

* *Supplementum Plantarum* 52, 316.

^f *Diet. Encyc. Meth.* ii- 255.

^J *Bort. Malabar.* \. t. 22,

[§] *Fam. PL* ri. S27.

^{il} *Coromand. PL* ii. 7, 8, 9, tt. 113, 114, 115.

*^J *Species Plantarum* iii, 2, 900.

** *Fam. PL* ii. 322.

^{ft} *Illustr.* t. 603.

^H *Jard. Malmais.* t. 28.

^{§§} *Synop**. ii. 276.

^enus *Ecastaphyllum* as having been 'established' by Richard: it had, however, been already proposed in 1756* by P. Browne for a species from Jamaica. The bearing of this proposal will be dealt with in a subsequent paragraph; it is enough to remark that Poiret accepts the transfer of *D. Monetaria*, but does not correct the error of Lamarck as regards var. ξ . of *D. hvecohria*.^ Of the eight additional species which Poiret adds to the two mentioned by Lamarck, only the three cited from Roxburgh really belong to the genus; the others are species of *Lonchocarpus* or of *Scsbania*. He only doubtfully admits Persoon's *D. Diphaca*, which is an *Ormocarpum*; he similarly treats Desfontaine's *D. latisiliqua*, an American species that still remains doubtful because, though admitted into the list of *Dalbergias* given in the *Index Keiocnsis*, it is not dealt with by Bentham in his revision of the group *Dalbergiean*.% Three years later an exceedingly important reference to *Dalbergia* was made by Roxburgh, in the form of a list of the species of this genus under cultivation in the Honourable Company's Botanic Garden at Calcutta§ in the year 1814, with a supplementary list of those species of which he had only seen Herbarium specimens and had prepared botanical descriptions for the manuscript of his *Flora Indica*. The latter work was not published till 1832, but the list, supported as the proposed species are by contemporary descriptions and drawings, thoroughly deserves full acceptance. For the benefit of those who may wish to consult this list, which was repeated in De Candolle's *Prodromus*, it seems advisable to give it once more in full with the names duly noted by which the various species are now known—

<i>Dalbergia ougeinensis</i> Eoxb.	=	<i>Ougeinia dalbergioides</i> Benth.
<i>latifolia</i> Eoxb.	=	<i>Dalbergia latifolia</i> .
<i>Sissoo</i> Eoxb.	=	<i>Dalbergia Sissoo</i> .
<i>emarginata</i> lioxb.	=	<i>Dalbergia latifolia</i> .
<i>frondosa</i> lioxb.	=	<i>Dalbergia lanceolaria</i> Linn. f.
<i>paniculata</i> E<-srb.	=	<i>Dalbergia paniculata</i> .
<i>zeylanica</i> E°xb.	=	<i>Dalbergia lanceolaria</i> Linn. f.
<i>robusta</i> Eoxb.	=	<i>Denis robusta</i> Benth.
<i>Inarginata</i> lioxb.	=	<i>Derris marginata</i> Benth.
<i>seandens</i> Eoxb.	=	<i>Derris scaudens</i> Benth.
<i>tamarindifolia</i> Eoxb.	=	<i>Dalbergia tamarindifolia</i> .
<i>fetipulacea</i> Eoxb.	=	<i>Dalbergia stipulacea</i> .
<i>rimosa</i> lioxb.	=	<i>Dalbergia rimosa</i> .
<i>reniformis</i> Eoxb.	=	<i>Dalbergia reniformis</i> .
<i>aluta</i> Eoxb.	=	<i>Derris thyriflora</i> Benth.
<i>parviflora</i> Eoib.	=	<i>Dalbergia parviflora</i> .
<i>fVmiginta</i> E'jxh.	=	<i>Dalbergia ferruginea</i> .
(Jrowey HOX'I.	←	<i>Derris robusta</i> Benth.
<i>rubiginosa</i> Eoxb.	=	<i>Dalbergia rubiginosa</i> .
<i>volubilis</i> lioxb.	=	<i>Dalbergia volubilis</i> .
<i>epiuosa</i> Ecxb.	=	<i>Dalbergia spinosa</i> .

* Nat. Mist. Jamaica 2£0.

f Poiret does not appear to have formed any definite opinion with regard to *Ecastaphyllum*, or indeed with regard to the group of artificial 'genera' that go to form the natural genus *Dalbergia*, for in 1804 we find him referring *Dalbergia Jmerimmonio Pterocarpus* (Encyc. Meth. v. 729); even after Ehrenh. had in 1806 'established' both *Amerimmon* and *Ecastaphyllum*, we find Poiret referring *D. Monetaria* in 1811 to *Pterocarpus* also (Encyc. Meth. Suppl. iv. CIO). Loureiro [Flur. Cochîn-Cliin. 431 (1?S'J)] has also a *Pterocarpus*, which is not the *Pterocarpus* of Linnaeus of 1747, nor that of 1763; neither is it the *Pterocarpus oi* Bergius of 1703. It is the tree now known as *Pongamia glabra*.

% Journ. Linn. Soc. iv. Suppl. (18G0).

§ *Eortus tiengalensis*, p. 53, p. 98.

Though it is clear from this list that the characters which separate *Derris* from *Dalbergia* had not been fully realised, and that Roxburgh had been unable from its original description to recognise *D. lanceolaria*, it will be observed that the *Ilortus Bengalcnsis* adds no fewer than ten distinct species to *Dalbergia*, a very substantial addition to our knowledge of the genus.

Dennstedt, who in 1818 published a Key to the *Ilortus Malabaricus*,* by name refers to three *Dalbergia*; as it so happens, not one of them is a member of the genus. The three are *Dalbergia arborea* and *D. heterophylla*, exactly as limited by Willdenow; with *D. lanceolaria*, in the sense, however, of Lamarck and not of Linnaeus. The first, as already explained, is the *Pongam* of Adanson; the third is that author's *Solori*. The second, which is in reality *Derris viliginosa*, is the *Scyllen* of Adanson; it is somewhat remarkable that, though the plant on which this genus was founded is nowadays correctly referred to *Derris*, the 'genus' itself is, by the authors of the *Index Kewensis* and by Dr. Kuntze, by oversight referred to *Dalbergia*. There are, however, two *Dalbergias* figured in the *Ilortus Malabaricus*; one of them, *D. torfa* (Rheede's *Kann-tagcra*X), is referred by Dennstedt to *Cassia*; the other, which is Rheede's *Ana-miillu*,§ Dennstedt has named *Amerimmon horridum*. The genus *Amerimmon* was originally 'proposed' for a West Indian shrub by P. Browne in 1756,|| it was established in Persoon's Synopsis in 1806,¶ and accepted by De Candolle in 1825,** by most subsequent authors it has been merged in *Dalbergia** There is no doubt that *Amerimmon* and *Dalbergia* are congeneric, and recently certain writers, notably Dr. Kuntze and Mr. Hiern, would insist on the substitution of the name *Amerimmon* for the name *Dalbergia* throughout. The objections to this proposal will be dealt with in a subsequent paragraph; in the meantime, however, it may be noted in passing that Dr. Kuntze, usually so accurate, has overlooked the fact that Dennstedt and Blanco had already anticipated his views and his action, with the result that Kuntze uses the name *Amerimmon sympalhetikum* for a species that nearly three quarters of a century earlier had been duly named *A. horridum* by Dennstedt. In 1821 Rothf| published as a new species *D. arhorca*, Heyne (not of Willdenow), which he considered to be very closely related to *D. lanceolaria*, but to be nevertheless distinct. In the writer's opinion, however, the differences, though marked, are not so great as to be specific for *D. lanceolaria* is a somewhat variable plant. In the same place Roth published a description of the fruits of *D. rubiginosa*, which had previously been unknown. In 1823 Blume founded, on what was really one of Roxburgh's species of *Dalbergia* *D. tamarindifolia*, a new genus—*Endespermum*.%%

In 1825 the condition of the genus was reviewed by De Candolle. §§ Only one new species was proposed, but this species (*D. timorensis*) was not really new*, it is simply the *Dalbergia lanceolaria* f. of Lamarck, not of Linnaeus, and the *Dalbergia scandens* of Roxburgh; it is not a *Dalbergia*, but a *Derris*, Sprengel in 1826||j| issued another and less exhaustive review, for he only gave 14 species. He readmitted *D. Macnaria*, which

* *Scldestel zum Ilortus Indian; Malabarims* 20.

f *Fam. PL* ii. 3:12 (1763),

X *Ilort. Malabar*, vi. 25.

§ *Wrrt. Malabar*, yiii. 40.

|| *Nat. Hist. Jamaica* 288 t. 3J, f. 3.

U Persoon, *Synops.* ii. 178 (*Amerimmon*).

** *Prodromes* ii. 421 (*Amerimmon*).

tt *Kov. Plant. Species*, 330.

XX *Cat. Geiv. Buitenzorg*, 92.

§§ *Prodromus* ii. 416.

J|] *Svst. Veg.* jii. 193.

Kichard had removed to *Ecastaphjllum*; included Willdenow's *D. arhorea*, which is a *Pongamia*; Poiret's *D. peniaphylla* and *D. heptaphylla*, which are *Lonchocarp*i; and added for the first time a species—*D. sericea* (Spreng., not of G. Don), which is a *Millettia*. He thus intensified the pre-existing confusion, but added nothing to our knowledge of the genus. The review of the genus presented by G. Don in 1832* is not really greatly in advance of those that had preceded it, for the same old confusion recurs, with indeed the addition of still another genus (*Mandelea*) to the list of those mistaken for *Dalbergia*; Don's *D. Barclayii* is a *Mundelea*. He has, however, described as new several species that are truly *Dalbergias*, the only one that interests us being *D. sericea* from Nepal, a quite distinct species, confused by Wallich with *D. hircina*, which is a name that had been proposed by Hamilton for *D. lanceolaria*.

The next considerable addition to the genus *Dalbergia* was made by Wallich when the distribution of the Honourable East India Company's Herbarium took place.† Graham, then Professor of Jotany in the University of Edinburgh, seems to have been mainly responsible for the identification of the various species. With a genus so difficult as *Dalbergia*, and where so great a mass of material had to be dealt with, it is not surprising that a few errors should have crept into the list. The species for the first time named in this list are:—*D. ovata* Grah.; *D. foliacea* Wall.; *D. cuiia* Grah.; (*D. tingens* Ham. = *D. stipidacca*); *D. cultrata* Grah.; (*D. glauca* Wall. = *D. ovata*) (*D. casswides* Wall. = *D. stipulacea*); (*D. nifa* Grah. = *D. tamarindifoUa*) (*D. mulijuga* Grah. = *D. tamarind folii*); (*D. Uviia* Grah. = *D. stipulated* in part and *D. tamarindifolia* in part); *D. rostrata* Grah.; *D. stipulata* Wall. (the name of this species had to be altered subsequently to *D. velutina* Benth.); [*D. purpurca* Wall. = *D. cana* Grah.]; (*JJ. hircina* Ham. = *D. lanceolaria*^ but part of the issue, though not Hamilton's part, is = *D. sericea*); *D. torta* Grah.; (*Z. flexuosa* Grah. = *D. reniformn*); (*D. horrida* Grah. = *D. spinosa*) *D. sissoides* Grah. The names within brackets prove on examination to belong to species already supplied with names, so that Wallich's list differentiates only eight previously unknown *Dalbergias*. Under *D. paniculata*, however, was issued *D. midtiflora* Heyne, which is not *D. pankidata*, as Wallich and Graham supposed, but is the species previously designated by Dennstedt *Jbnerimnwn horridum*, and subsequently named by Nimmo *Dalbergia sympathetica*; while under *D. hircinn* was included not only Hamilton's plant of this name, which is *D. lanceolaria*, but another which, just about the time the list was issued, was differentiated by G. Don as *D. sericea*. The Wallichian collection therefore contains in all nine species not formerly known. The Wallichian list includes *Dalbergia ovgeinensis*, which is an *Otiginia*, also *D. robusta* and *D. scandens*, which are species of *Denis*, sect. *Brachypterum*. In 1831 Wight and Walker-Arnott, in their account of *Dalbergia* § still retained *Denis (Brachypterum) scandens* in *Dalbergia*, but from this time onward the limits of *Dalbergia* have been, in all important works on Indian botany, carefully observed, and the additions to the genus that have from time to time been made do not require to be recorded, since they appear from the citations given under the individual species dealt with in this work.

* *Gen. Syst. Gard.* li. 374-
 † *Lith. Cat.*, 6847-5377 (18S2).

+ *Grah. Cat. Bomb. Pl.* 56 (1839),
 § *Frodr. Penins. Ini.* i. 2j*.

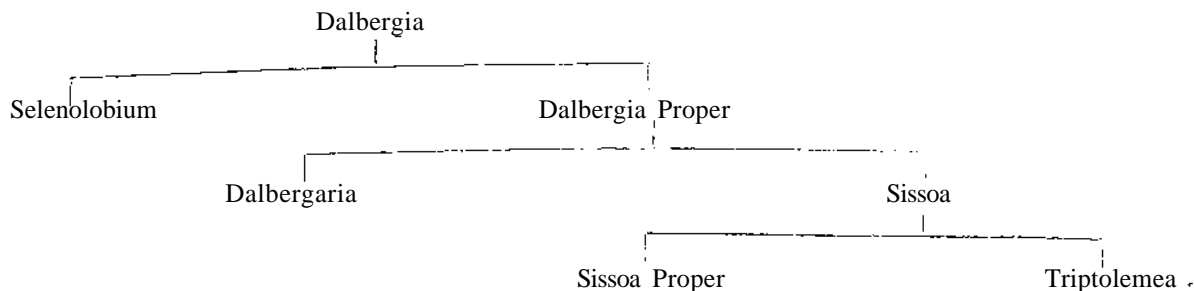
§ 20 *Sketch of the attempts to classify the species of Dalbergia.*

The year 1834* is marked by the first real step in advance as regards the internal classification of the species of *Dalbergia*. To have thrown out of *Dalbergia* all foreign elements save the *Brachyptera* was to have done much; and if it may be said that we owe this to Graham's assortment of the Wallichian *Dalbergias* in 1832, we have to recognise that Wight and Arnott went still further when, while retaining *Derris scandens* in *Dalbergia*, on account of its pod, they treated it, because of its opposite leaflets and its versatile anthers, as the type of a distinct subgenus. More important, however, was their proposal to subdivide the true *Dalbergias* into two distinct groups according to the monadelphous or isodiadelphous arrangement of the stamens, because this proposal became the basis of the first attempt made by Bentham in 1851 to divide the genus into natural sections. Bentham at the same time reduced to *Dalbergia* the Malayan *Endespermum* proposed by Blume, the African *Podiopetalum* proposed by Hochstetter, and the American *Triptolemea* proposed by Martius, subdividing the whole into three sections:—(1) *Simoa*, with the stamens monadelphous and the pod long and straight; (2) *Selenolobium*, with the stamens of *Sissoa*, but the pod short and lunate; and (3) *Dalbergaria*, with the pod of *Sissoa*, but the stamens isodiadelphous. The subdivision was convenient, and at the time it was proposed appeared to be natural. There were, however, only 29 species then known, and of these only two—*D. spinosa* and *D. torta*—were known to have the pods of *Selenolobium*, though, as a matter of fact, two other species, whose fruits were then unknown to Bentham—*D. parvijlora* and *D. reniformis*—have *Selenolobium* pods. Miquel, when in 1855 he described the Malayan species of *Dalbergia* adopted Bentham's three sections and observed, what Bentham had overlooked, that *D. parvijlora* must be a *Selenolobium*. He did not, however, suggest any alteration in the principle of classification. In 1860 Bentham returned to this subject in the course of his classical essay on the *Dalbergiaceae* a model of lucidity and method. The pod, as he there explains, which had formerly been chiefly relied on in separating *Dalbergia* from other Leguminosae, must now be abandoned as a primary guide. A limitation based entirely on the pod involves, as we have seen in the historical review of the genus prior to 1834, the inclusion of many species with different foliage and inflorescence and, above all, with very different stamens—species that are much better referred to *Derris* and to *Lonchocarpus*. If insisted upon, it would logically involve the suppression of various distinct and apparently quite natural genera like *Platymiscium* and *Leptolobium*. On the other hand, if rigidly applied, the character afforded by the pod would involve the exclusion from *Dalbergia* of the species for whose accommodation Bentham has proposed the section *Selenolobium*, and would further emphasise the exclusion of the quite artificial genus *Ecastaphyllum*. Restricting in this fashion the generic importance attached to modifications of the pod, Mr. Bentham explains that, had he for the first time been grouping the species of this genus, he would have divided it into three artificial sections—(a) *Dalbergia*, with a long straight pod; (b) *Selenolobium*, with the pod thicker and lunate or reniform; and (c) *Ecastaphyllum*, with the pod orbicular or nearly so. The actual delimitation adopted was a modification of this design.

* Wight & Walker-Arnott, *Prodr. Penins. Ind.* i. 204.
 † *riantcB Junghuhnian** i- 254.

J. Flor. LuL. Bat. i. 1, 126.
 § *Journ. Linn. Soc.* 17, *Suppl.*

Ecastaphyllum, though so very artificially distinguished, had become so well known under this name that it appeared to Bentham convenient to retain it as a genus; *Selenolobium* is, as in the *Plant. Junghuhnianae*, treated as a section of *Dalbergia*; *Dalbergia* proper is further subdivided into *Triptolemei*, *Sissoa*, and *Dalbergaria*. *Dalbergaria* is precisely the section of this name proposed nine years earlier. *Sissoa*, however, is somewhat curtailed owing to the separation of *Triptolemea*, within which are placed all the species, previously referred to *Sissoa*, that have very small flowers disposed in 2—3-chorous cymes. For the species, as known to Bentham, the system thus provided was at least quite convenient; so satisfactory, indeed, did it prove that when, in 1865, Bentham had occasion to again review the *Dalbergieae** he adopted the same four sections; and when, in 1869, Bailion independently reviewed the *Leguminosae* that author also found it unnecessary to modify Bentham's arrangement of 1860. It is, of course, easy now, when the details of structure and the limits of species are better known than they were in 1860, to point out certain objections to a system which, as Bentham has expressly warned us, provides us with sections that are defined by rather uncertain characters; indeed, he has himself indicated in the *Genera Plantarum* the feature which chiefly invalidates it, since he has pointed out that *D. reniformis*, which in 1860 he had referred to *Dalbergaria*, might be referred to *Selenolobium* equally with the species he had already placed in that section. Now these other species, but for their semilunar pods, would have been species of *Sissoa*; so that within *Selenolobium* there is the same cleavage as there is within *Dalbergia* proper, since we have *D. parvijhara*, by flowers a *Triptolemei*, in which Bentham has placed it, and by fruit a *Selenolobium* as Miquel has pointed out; *D. torta*, by flowers a *Sissoa*, and *D. reniformis*, by flowers a *Dalbergaria* are, by pods, equally *Selenolobium*. Any system of delimitation that is to be logically exact must, in view of these facts, either further subdivide *Selenolobium* exactly as *Dalbergia* proper is subdivided or must accept Bentham's verdict as to the unimportance of modifications of the pod not only so far as the limitation of genera, but so far as the limitation of sections is concerned. There is, however, a further and, the writer believes, valid objection, not to the results, which are really good, but to the presentation of the four sections admitted by Bentham. They cannot be stated serially without remark because, besides being of unequal rank, they are the outcome of a successive dichotomy as follows:—

* *Genera Plantarum* i. 54 4.t *Histoire des Plantes* ii. 511 t

The year 1876 was marked by the appearance of two very important papers on Asiatic *Dalbergias*—one by Kurz* on the species of Burma, the other by Baker on the whole of the species of India. Both authors modify Bentham's system: Baker does so only to the extent of suppressing the concluding dichotomy of the preceding paragraph, reverting to the system proposed by Bentham in 1851 and followed by Miquel in 1855, with the result that the section *Triptolemea* disappears. For Baker's action there is much to be said; it is not altogether convenient to unduly multiply groups that are separated by characters of unequal value. It is not, however, possible to endorse Baker's view that groups which, as Bentham truly says, cannot be considered to be well-defined or natural sections, constitute subgenera. Kurz, who independently does the same thing as Baker with reference to *Dalbergia* proper, which he divides into the subgenera *Dalbergaria* and *Sissoa*, has, with reference to *Scenolobium*, adopted a view that probably no one will accept—certainly hitherto no one has endorsed. The chief objection that can be taken to Baker's treatment of the genus is that he should have raised the section *SeUnolobium* of Bentham to the rank of a subgenus instead of acting upon Bentham's hint and formally distributing its species among *Sissoa* and *Dalbergaria*. Kurz, however, has done more than treat Bentham's section *Selenolobium* as a subgenus of *Dalbergia*—he has removed it from *Dalbergia* entirely, and, in spite of its very different anthers, has merged *SeUnolobium* in *Drepanocarpus*. Taubert, in his useful revision of the Leguminosae in 1891, has taken what the writer believes to be a step in advance by reducing the genus *Ecastaphyllum* to *Dalbergia*. In the suggestion there is nothing original: as long ago as 1860 Bentham pointed out that, if naturally treated, *Ecastaphyllum* is a section of *Dalbergia*, and even then only an artificial section. From considerations of convenience alone, Bentham consented to recognise the group *Ecastaphyllum* as a genus; Taubert's action in merging it in *Dalbergia*, as Bentham in 1860 might have done, is rather a proof of the extent to which our views as to convenience have changed than a mark of advance in our knowledge. The most noteworthy feature of Taubert's action lies in his having merged *Ecastaphyllum* in the section *Selenolobium* instead of recognising in it a distinct section, as Bentham was inclined to do. That Taubert is right in what he has done is certain: *Ecastaphyllum* is in no way to be distinguished from *Scenolobium*. The defect of Taubert's system lies in its not going sufficiently far; in its not recognising that the cleavage-plane which permits us to separate *Scenolobium* is not parallel to, but intersects the cleavage-planes between the remaining sections; and in its failing to take this opportunity of suppressing entirely the quite artificial and, in the light of our later knowledge, impracticable and contradictory section *SeUnolobium*. Except for the real merit of having incorporated *Ecastaphyllum* definitely in *Dalbergia*, Taubert's system makes no advance on Bentham's system. He has not accepted Baker's union of *Triptolemea* and *Sissoa*; still less has he countenanced Kurz's transfer of *SeUnolobium* to *Drepanocarpus*.

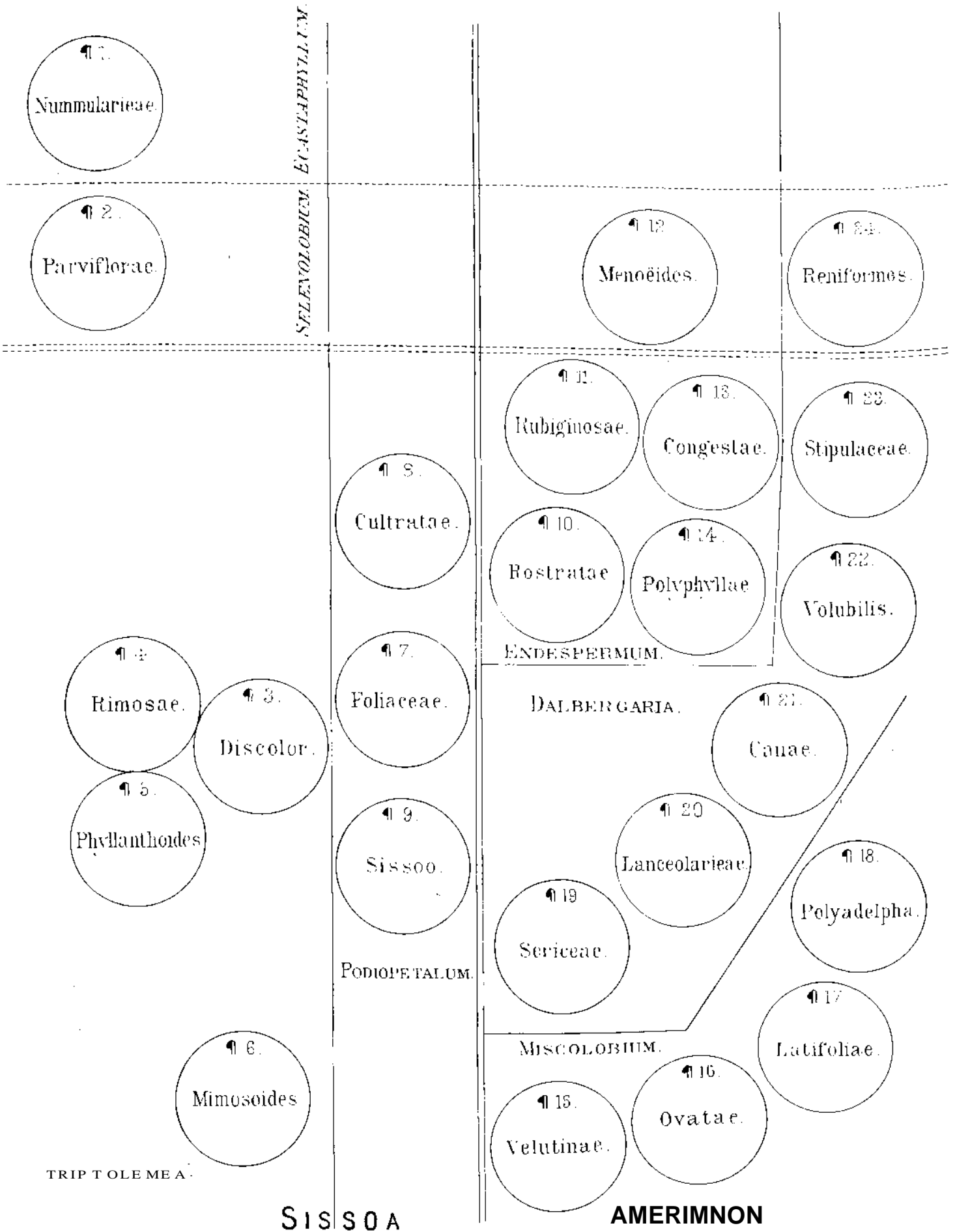
It is with some reluctance that the writer now offers a further criticism of the system thus universally adopted. As regards the section *Scenolobium*, it is

* *Journ. As. Soc. Beng.* \v. 2, 278; also *For. Flor. Brit. Burm.* i. 33f, 341 (one year later).

f *Uook. Ind.*, *Flor. Brit. Ind.* ii.

J Engler *A Prunl, Njtu'dich. Pflanzenfam.* iii. 2, 335.

improbable that any one who makes a serious and prolonged study of the genus will fail to agree with the statement that this section is not real, but imaginary. The pods of species of the postulated section by no means agree with each other*; their only common feature is a negative one; they are not samaroid pods, as is the case with the bulk of the *Dalbergias*. Their nearest allies are not *Sissoae* or *Dalbergariae* or *Triptolomeae* in particular, but are to be found scattered throughout the genus. Some have pods with a thick corky mesocarp, others have little or none of this suberous thickening; still other species, e.g., *D. stipulaoea*, combine a local suberous thickening of the mesocarp opposite the seed with & samaroid structure elsewhere. Finally, and perhaps most important consideration of all, the structure of the pod in all the species of *Selenolobium* or *Ecastaphyllum* is such as to adapt the organ for dispersal by water or for the protection of the contained seed in swampy forests, and just in so far as it is possibly the result of environment does this structure fail to afford a character that is taxonomically useful. However, even after the species of *Selenolobium* are relegated to their natural positions within the genus, matters do not appear to be entirely satisfactory. Benthain's section *Iriptomca* is a useful and a fairly natural section; his section *Dalbergaria* is even more natural and quite as useful. But Bentham's *Sissoa* is residual rather than natural, since it includes many species that are precisely *Dalbergias* except that they have monadelphous instead of isodiadelphous stamens; many species that are practically *Triptolomeas* except that they have larger flowers and usually longer styles; and finally, many species that, agreeing in the main with the monadelphous species which in other respects are exactly like *Dalbergaria*, differ from these as regards vexillum as much as these differ from *Dalbergaria* as regards stamens. If, then, the species of *Dalbergia* must be divided into sections at all, and when the crowd of species to be dealt with is considered, such a subdivision seems very desirable, these sections ought clearly to be groups of as nearly as possible equal natural rank. When such a subdivision is made, five sections must be recognised, These sections aggregate themselves naturally in two larger groups that may be treated as subgenera. The characters on which this classification depends are detailed in the systematic part of this review; it is sufficient for the moment to say what they are and to explain what relationship they bear to the groups proposed by previous writers. All the *Ecastaphylla* of America and Africa appear to be *Dalbergariae* as to flowers, One of the Asiatic *Ecastaphylla* (Σ , *Bccarii*), however, is certainly and the other (2° , *Albertisii*) is probably a *Triptolomea*. Three of the *Selenobia* are undoubtedly *Dalbergariae*, and there is possibly a fourth belonging to the same section. Two of them are, however, *Triptolomeae*, and in all probability a third belongs to the same section. The remainder belong to that section of the old and undifferentiated *Sissoa*, where the flowers are neither like the flowers of *Triptolomea* nor like the flowers of *Dalbergaria*. These species thus disposed of, the genus *Dalbergia* is easily divisible into two subgenera: (a) *SISSOA*, of which the well-known species, *D. Sissoo*, exhibits in a well-marked fashion most of the characteristics; and (b) *AMEIMNON*, of which *D. Amerimum* may be taken as the type. This *SISSOA* does not correspond exactly with the section of that name proposed by Benthara in 1851 or with the corresponding subgenus recognised by Baker and Hurz in 1876, since it eliminates all those species that have monadelphous stamens, but have at the same time hastate wing-petals, *AMSRIMNON*, on the other hand, does not (apart altogether from the inclusion of certain *Selenobia*) correspond with the *Dalbergaria*

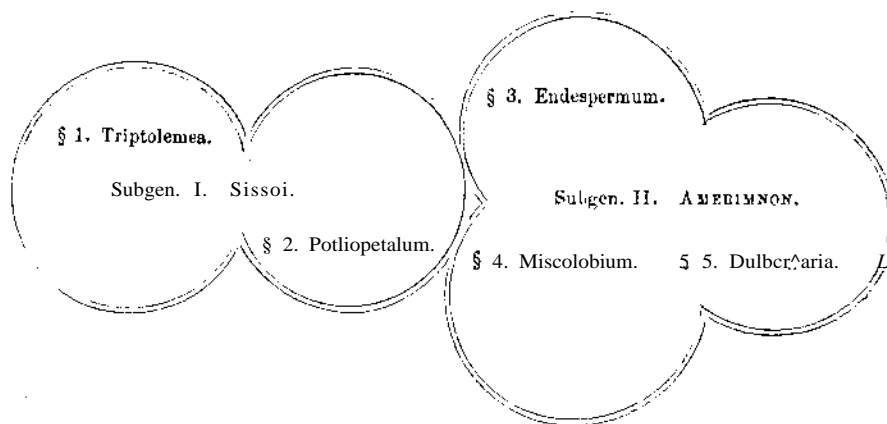


DISPOSITION OF ASIATIC GROUPS OF SPECIES OF DALBERGIA.

Lith: by Chitra Silpi C?

of these authors, since it includes the monadelphous species that have wing-petals like those of the isodiadelphous ones. Within *SISSOA* we find two sections—(1) *Triptolemea*, which is practically identical with the *Triptolemea* of Hentham, Baillon and Taubert, deviating only in the inclusion of a group of species with small flowers and short styles that are by these authors relegated to their *Sissoa*; and (2) *Podtopetalum*, of which *D. armala* from Africa may be taken as typical, but which also includes *B. Sissoo* itself. Under *AMERIMNON* again we find three sections—(3) *Endespernum*, of which *D. tamarindifolia* may be considered typical, and which as a genus was well characterised by Blume; (4) *Miscolobium*, of which the American *D. foliolosa* and the Asiatic *D. velutina* may be considered good representatives; lastly, (5) *Dalbergaria*, which, save for the inclusion of a few *Selonolobu*, is exactly the section of this name as characterised by Bentham.

The arrangement now adopted the writer believes to be more natural, and finds to be certainly more convenient than any system hitherto suggested. It has been arrived at, not by the method of adopting arbitrary characters and subdividing the genus according to these, but by the opposite method of first throwing the different species into small groups of closely allied forms, and subsequently bringing together the more closely allied of these apparently natural groups. The method is only an amplification, in the light of the evidence afforded by fuller and more complete suites of specimens, of the Benthamian method; the underlying motive is the same—to facilitate the identification of the species. An examination of the often complex synonymy will show how necessary some such modification is: whether the system now proposed will stand the test of further discovery and investigation is a point that can only be tested by experience. In the accompanying sheet (PLATE 1) is exhibited a schematic view of the disposition of these natural groups with reference to each other and to the subgenera and sections to which they severally belong. The unbroken lines mark the sectional limits; the dotted lines show the cleavage that artificially separates the *Selenobia* and *Eiastaphylla*. The relative position of the sections is shown with approximate accuracy in the subjoined diagram:—



§ 3. *The validity of the generic name Dalbergia.*

Before proceeding to give a formal definition of the genus, it is necessary to bestow a little consideration on the name that it ought to bear. Leaving out of account the names *Endespermum* Bl. (1823),* *Scmeionotis* Schott (1829), f *Miscolobium* Vog. (1837),} *Triptohmea* Mart, (1837),§ *Lcilobium* Benth. (1838),H and *Podiopetalum* Hochst. (1841),^] which have been applied to species of *Dalbergia*, and neglecting the terms *Dracnsteinia* Neck. (1790)** and *Ilccastophyllum* II. B. & K. (1834),tt proposed for *Ecastaphyllum*^ since the *Supplementum Plantarum* was issued in 1781, we have several other names with priority as to *dale* over the name *Dulbergia* that call for consideration. In the *Index Keivensis* and in the *RevUio Generum Plantarum* of **Kuntze** — works that have been prepared with very great care—two such names, both dating from **1763**, are by some oversight cited under *D oilergia*. These are *Salken* A dans, and *Solori* Adans. ;%% the plants on which these genera arc founded being respectively *Dcrris scandens* and *Dcrris uliginosa*, the names do not further trouble us. There are, however, several others that must be considered. Taken in inverse chronological sequence, we find *Acouroti* Aubl. (1775); §§ *Ptev. carpus* Berg. (1769)(|| and *Ecastaphyllum* P. 13r. (1756) %^ applied to species with nummular pods, and *Amerimnon* P. Br. (1756)*** applied to species with samaroid pods.

As regards the name *Acouroa*, the fact that it applies only to a species with nummular pods appears to the writer to exclude it from further consideration. If the species characterised by pods of this kind are to be artificially separated as constituting a distinct genus, the earlier name *Ecastaphyllum* would be with propriety adopted to designate them. With the name *Pterooarpus* matters are different, since we have seen that though Bergius appears to have confined its incidence to species with nummular pods, Poiret at least employed it to designate both species with nummular and species with samaroid pods. However, the name is not available for the genus *Dalbergiot* because in **1747** it was used by Linnaeus to designate a species of *Derris*, and in 1763 it was again used to designate a species of the genus usually recognised as *Pterocarpus*. Kunlze, insisting on absolute priority, uses the name for the genus here spoken of as *Derris*; others, with whom the writer agrees, prefer to employ the name *PkrocQ-rpus*, as Linna3us did in 1763, when he had perfected his system of nomenclature, rather than to use it as Linnaeus did in 1747, when that system had not yet been matured. In any case we are left free to consider, without reference to Bergius' name, the remaining two names proposed by P. Browne in 1750.

The point that has first to be clearly appreciated is that there was no confusion of ideas on the part of P. Browne: he used the name *Ecastaphyllum* for a species with nummular pods, the name *Amerimnon* for a species with samaroid pods. So long as the two groups of species thus indicated were kept apart, it is clear that for the genus with nummular fruits the proper name was *Ecastaphyllum*; for the genus with

* *Cat. Gem. Buitenzorg*, 23.
 t *Wiener Zeitschr.* iii. 804.
 J *Linncea* xi. 200.
 § *Flora xx. Scibl. U2.*
 || *Ann. Wiener Mus.* ii. 94.
 % *Flora xxiv.* 657.
 ** *Ehm.* iii. 33.

tt *Kov. Gen. § Spec.* vi. 387.
 Xt *Fam. PL* ii. 322, 3^7.
 §§ *PL Guian.* 763, t. 301.
 ■H *Yet. Acad. Handl. StocJch.* 116.
 līt *Hist. Jamaic.* 2W.
 *** *Hist. Jamaic.* 288.

samaroid fruits the true name was *Amerimnon*. However inconvenient their action may be, there is therefore no doubt that Kuntze and Hiern are logically justified in proposing to suppress the name *Dalbergia* and replace it by the name *Amerimnon*. Indeed, from a strictly logical standpoint, the name *Dalbergia* was at all times indefensible if the separation of the species with nummular and with samaroid fruits be justified, because the genus *Dalbergia* was expressly devised to include species with fruits of both types. From the moment, however, when Bentham showed that the group *Ecastaphyllum* is not a natural genus, and particularly from the moment that Taubert carried Bentham's conclusion into actual practice, the names *Amerimnon* and *Ecastaphyllum*, being partial, were rendered alike incorrect and inappropriate, and the name *Dalbergia* became the only name that can with any propriety be applied to the whole genus.*

§ 4. *Distribution of the Asiatic species of Dalbergia.*

The genus *Dalbergia* is widely distributed throughout South-Eastern Asia, and extends from Beluchistan, the Concan and Ceylon to Kiangsu in China, the Philippines and New Guinea. Two species extend eastward from the Philippines and north of New Guinea to the Caroline Archipelago; two species cross from New Guinea into North Australia. One of these latter species extends eastward to New Caledonia, Fiji and Vavau. This Melanesian species is *D. torta*, a member of the section *Endespermum*, with pods so modified as to adapt them for dispersal by ocean currents; its wide distribution shows that it is a typical member of the Indo-Malayan Strand-flora. The presence of *D. torta* in islands so remote as Fiji and Vavau is thus readily accounted for, and Melanesia, so far as *Dalbergia* is concerned, possesses only a species that occurs in every other natural area in South-Eastern Asia that has a sea-coast. The two species that occur in the Carolines are again *D. torta* and with it a species whose pods are similarly, though less obviously, adapted for dispersal by water. This is *D. ferruginea*, which occurs everywhere throughout Papuasias and Eastern Malaya, but does not appear to cross the Wallace line to the west. The two that occur in Australia are once more *D. torta* and another species, *D. densa*, characteristic of New Guinea, the Moluccas and the Key and Aru Archipelagos; in Australia it is confined to the coast of Queensland and certain islands in Torres Strait. So far as *Dalbergia* is concerned, then, both Micronesia and Australia are mere prolongations of Eastern Malaya and Papuasias.

Ceylon, the south-western extreme of our area, is in like case. Here there are only three species, one of these being again the littoral *D. torta*; the others are *D. revstrata* a species that extends from Celebes to South India, and *D. lanceolaria*, a species that extends throughout the Indian Peninsula as far as the North-Western Himalaya. Ceylon is thus a meeting ground of Malayan and Indian influences, and, so far as *Dalbergia* is concerned, has no distinguishing features. Since, however, all three Ceylon species occur in Malabar, while only two occur in Malaya, we conclude that, so far as *Dalbergia* is concerned, Ceylon is a mere annex of Malabar.

* An exactly converse instance has been already fully explained by the writer (*Jcuni. As. Soc. Seng.* lxxvi. ?, 404). The genus *Mucuna*, as founded by Adanson in 1763 and as accepted by all subsequent authors, in reality is a complex of two extremely distinct and natural genera founded by P. Browne, viz., *Stizolobium* and *Zoophthalmum*. So long as we are content to accept Adanson's erroneous complex as a genus, we are logically bound to accept and use Adanson's name *Mucuna*; so soon as it is realised that in reality two genera are confused under this name, Browne's two names, *Stizolobium* and *Zoophthalmum*, will come into use and Adanson's name must be abandoned.

A region similarly outlying and similarly destitute of distinctive features is the North-west Frontier or Indian Desert region. Here, again, there are three species. Two of these—*D. lanceolaria* and *D. latifolia*—are very characteristic of India generally, though both cross the Gangetic plain to the Himalaya; the third is *D. Sissoo*, a species very characteristic of the sub-Himalayan forests from Assam to the Panjab and Beluchistan, but rarely, if ever, met with wild to the south of the Gangetic plain and Rajputana. As the desert region has thus two species that are characteristic of the Indian Peninsula as against one that is characteristically sub-Himalayan, we may treat the area as an annex of India Proper, though, just as Ceylon is a meeting place of Indian and Malayan influences, India Deserta is a meeting place of Indian and Himalayan influences.

Existing political boundaries and ethnological considerations render it not inexpedient to divide South-Eastern Asia into five fairly equal botanical provinces: India; Indo-China; China; Malaya; Papuasias. India may be further fairly naturally subdivided into four sub-areas: (1) Malabar, including Ceylon, Malabar, and the Concan with the hinterlands of the two latter as far eastward as the influence of the south-west monsoon is directly felt; (2) Coromandelia; Coromandel, the Dekkan, Central India, or the whole Indian Peninsula to the east of Malabar and south of the Gangetic plain; (3) India Deserta; the area of scanty rainfall in Scinde, Rajputana, the Panjab, and along the trans-Indus frontier; (4) the Himalayan ranges, from the Indus to the Brahmakund, through which the waters of the Sanpo reach the Brahmaputra. Indo-China seems to lend itself to further subdivision into the following subareas: (1) Assam-Arracan; a block of hill-ranges lying between the Brahmaputra and the Irrawaday rivers, and extending from the Mishmi-Kachin countries, which are of Himalayan character and which border on Tibet and China, as far as the Andaman islands, which are a southward prolongation of the Yomah of Arracan and have a mixed Burma-Malay vegetation; (2) Shan; another region of hills and plateaux lying east of the Irrawaday, bounded on the west by the Mekong as far south as 20° N. lat., afterwards by the Meinam; this subarea includes to the south Teuasserim, where, again, there is a marked Malayan element in the vegetation; (3) Siam-Anam; a region of plains and lower hills extending southward from 20° N. lat. and east of 100° E. long., including Siam, Laos, Cochin-China generally. In the extreme north-east of Indo-China lies the province of Tongking, too small to be considered a subarea apart, yet, so far as the genus *Dalbergia* is concerned, calling for special treatment. Hitherto only four *Dalbergias* have been definitely recorded from Tongking—none of them endemic; if we except *D. torta*, which occurs on nearly every coast throughout South-Eastern Asia, and is not therefore characteristic of Indo-China in particular, none of the four occur either in the Anam-Siam or in the Shan subareas. One of the Tongking species—*D. rimosa*—is characteristic of the Himalayan area, where it extends from Sikkim to Upper Assam; of the northern portion of Western Indo-China, where it extends from Sylhet and Cachar to Kachin; and of South-Western China (Yunnan). The other two species—*D. Balansae* and *D. tonkinensis*—extend to Tongking from South-Eastern China. There is a fifth species, the identity of which is doubtful, in the same area. This is *D. jmnata* (*Derris pinnata* Lour.), usually identified with *D. lamariniifolia*, which, if Loureiro's description be exact, cannot well be the case. The diagnosis given by Loureiro agrees best with the description of *D. MilUttii*: should the two prove to be the same, then Tongking has three species that extend from South-Eastern China. Tongking has been only inadequately explored botanically, and the absence of forms peculiar to the province or common to Tongking and Central Indo-China, or to Tongking

and the rest of Eastern Indo-China may be but an index of this imperfect investigation ; as matters stand, however, it seems necessary to separate Tongking from the rest of Indo-China and treat it as an annex of China.

An examination of the list of species in which the distribution is tabulated will show that, so far, 23 species have been collected within Chinese territory. One of these species — *D. obtusifolia*—has, however, to be eliminated; it is Chinese only in name, and can be included in a Chinese list only because it occurs in the Taping Valley in South-Western Yunnan. Physiographically, for the valley forms part of the catchment area of the Irrawaddy, this Taping Valley is a portion of Central Indo-China; of the two *Dalbergias* reported from the valley, one occurs nowhere in China outside its limits; no exclusively Chinese *Dalbergia* enters the valley. The reasons that call for the annexation of Tongking to China equally demand the recession of the Cis-Salwin part of Yunnan, drained into the Irrawaddy, to Central Indo-China.

China then, modified by the inclusion of Tongking and the separation of the Taping Valley, has 22 species of *Dalbergia*. If we exclude the littoral species, *D. torta*, which extends throughout South-Eastern Asia, we have then 21 species of *Dalbergia*, of which two—*D. fusca* and *D. stipulacea*—extend to Eastern Indo-China; four—*D. fusca*, *D. stipulacea*, *D. burmanica*, and *D. tamarindifolia*—extend to Central Indo-China; and seven—*D. stipulacea*, *D. burmanica*, *D. tamarindifolia*, *D. rimosa*, *D. assamica*, *D. Kingiana*, and *D. mimosoides*—extend to Western Indo-China.

When the occurrence of these species within the Chinese Empire is examined more in detail, useful subdivision of the region into three subareas is possible. These are: (1) South-Western China; comprising Yunnan and Western Szechuen to the west of long. 105° E.; (2) Central China; Eastern Szechuen, Kweichow, Hunan, Hupeh, Kiangsi; (3) Eastern China; Chekiang, Fokien, Kwang-tung, Kwangsi, and Tongking. Central China has only four species—*D. stenophylla*, *D. Dyeriana*, *D. hupeana*, and *D. Balansae*. Only one of these, *D. stenophylla*, is confined to the region, and it affords little direct proof of isolation because it is closely allied to *D. MiUettii* of Eastern China, and equally closely allied to *D. mimosoides*, which occurs throughout South-Western China and extends thence to Assam and Sikkim. *D. Dyeriana* occurs both in Central and in South-Western China, but it is more distinctive of the central region and seems only to cross into Yunnan, but not to be widespread in that province. Similarly, *D. hupeana* occurs both in Central and in Eastern China; in this case, however, the species is clearly distinctive of Central China, and its occurrence in Kwangtung among the eastern provinces may be due to its being there a planted species. On the other hand, *D. Balansae*, which merely overflows into Central China (Kiangsi) from Eastern China, and is in no sense distinctive of Central China, may be in Kiangsi only planted. The endemic factor $\frac{1}{25}$, or 25, is low, and the subarea is not at all an isolated one. South-Western China has fourteen species. These are—*D. obtusifolia*, *D. tamarindifolia*, *D. mimosoides*, *D. Dyeriana*, *D. fusca*, *D. Kingiana*, *D. Henryana*, *D. binmanica*, *D. assamica*, *D. stipulacea*, *D. polyadelfa*, *D. szemaoensis*, *D. rimosa*, and *D. yunnanensis*. But, as has been explained, the first species—*D. obtusifolia*—is only Chinese because the Taping Valley, which is a portion of the catchment area of the Irrawaddy Valley, forms part of the political system of China; it has therefore to be excluded when, as here, only natural facts are under consideration. *D. fusca*, *D. burmanica*, *D. tamarindifolia*, *D. stipulacea*, *D. assamica*, *D. rimosa*, *D. Kingiana* are Indo-Chinese or Himalayan species that cross the frontier into South-Western China, the only one going on into Eastern China being *D. rimosa*. Of the

remaining species, *D. mimosoides* does not afford evidence of isolation; it extends to Assam and Sikkim, has a related species (*D. stenophylla*) in Central China and another allied form (*D. Millettii*) in Eastern China. *D. Dyeriana* is even less distinctive, since it appears to be a mere overflow from Central China: *D. Henryana* is hardly more distinctive than *D. mimosoides* because, though itself undistributed, a very close ally (*D. Kingiana*) extends to the adjacent Kachin country in Western Indo-China, and another ally (*D. Benthami*), not quite so intimate, but still near, occurs in Eastern China. *D. yunnanensis* has a close ally (*D. CoUettii*) on the Shan Plateau in Central Indo-China; *D. tzemaensis* belongs to a group of species most strongly represented in Indo-China: the most distinctive species of Western Indo-China is *D. polyadelphia*. By the most liberal computation, then, the endemic factor for South-Western China is only 23, or 23. Eastern China, as defined above, though with fewer species, shows a higher degree of isolation. Here there are nine *Dalbergias*: *D. Mdkilii*, *D. Uancei*, *D. Benthami*, *D. tonkinensis*, *D. sacerdotum*, *D. rimosa*, *D. Imp-am*, *D. Balansae*, *D. torta*. Of these, the first five are endemic, though, for reasons already made clear, the evidence of *D. Millettii* as to isolation is not conclusive, while that of *D. Benthami* is not great. On the other hand, the evidence of *D. Balansae* is greater than would at first sight appear, since it is widespread in Eastern China, but only overflows, and then perhaps only as a planted species, into Kiangsi in Central China; and *D. hupeana*, which only occurs, and again perhaps only as a planted tree, in Kwan-tung, gives nearly as strong negative evidence in favour of the isolation of Eastern China as the positive evidence of *D. Balansae*, *D. Ilancti*, *D. tonkinensis*, and *D. sacerdotum*, which are all distinctively Eastern Chinese species. The two that remain are *D. rimosa*, a species widespread in South-Western China, Western Indo-China, and the Eastern Himalaya, which extends to Tongking without having so far been met with in Central Indo-China; finally, *D. torta*, which occurs on the coasts of South-Eastern China and of Tongking, and has been reported from every coast throughout our Asiatic region except those of the Sunda islands and of Coromandel. The endemic factor for Eastern China is therefore 55.5.

Excluding, then, the Central Indo-Chinese species that is Chinese only because of non-occurrence in the Taping Valley, and including, as we must, within Chinese limits the province of Tongking, we have an area with 22 species, of which 13 are endemic, that its endemic factor is 59, or just under 60. The connection between China as a whole on the one hand and Indo-China or the Himalaya on the other is, however, entirely confined to South-Western China. If this district be excluded and the adjoining districts of Central and Eastern China be considered together, we have then an area with 11 species of *Dalbergia*, whereof 8 are endemic. The endemic factor for Central and Eastern China is thus 72.7, indicating a degree of isolation higher than is to be met with in any similar area in South-Eastern Asia.

The Philippines, physiographically much isolated, with ten reported species of *Daluenna* have only three peculiar forms, *D. polyphylla*, *D. Mimosella*, and *D. Cumingiana*. One of the remaining species is the ubiquitous littoral *D. torta*; another reported sea-shore species is *D. rosacea*, which occurs also on the coasts of Indo-China and Coromandel. The others are: (1) *D. tannrindifolia*, a species present both in Malaya and in Central Indo-China; (2) *D. rariviflora*, widely spread in Malaya; (3) *D. ferruginea*, a species confined to the Caroline Archipelago; (4) *D. discolor*, a species common to the Philippines, Celebes, and Borneo; and (5) *D. Minahassae*, a species common to the Philippines and Celebes. The Philippine endemic factor is thus 30, and too

small to admit of the treatment of the Archipelago as a distinct area. For our present purpose, and so far as the evidence from *Dallergia* goes, it may conveniently be treated as a subarea of Papuasias, though, as a matter of fact, the Archipelago is more or less of a meeting ground of Papuan, Malayan, and Indo-Chinese influences. The Papuan subareas proper have very few species of *Lalbergia*. New Guinea itself so far has only yielded four species; *D. Alberti*, endemic; *D. densa*, extending throughout the Moluccas to the west and to Australia on the south, but not reaching Celebes or the Philippines; *D. ferruginea*, extending throughout the Moluccas and into Timor, Celebes, the Philippines, and the Carolines; finally, the widespread littoral species, *D. torta*. The endemic factor for New Guinea being $\frac{1}{25}$ only, the island cannot, so far as *Dallergia* is concerned, be considered a natural area apart. In the Moluccas, the next subarea to the east, we find five species; again with only one—*D. Ja/urii*, confined to the Key Archipelago,—endemic; the others are *D. densa* and *D. ferruginea*, mentioned in detail for New Guinea; the widespread *D. iorta*; finally, *D. parviflora*, a species common throughout the Moluccas, but not possibly only an introduction from Malaya, where it is widespread. The endemic factor for the Moluccas being $\frac{1}{20}$ only, we cannot consider the Archipelago a distinct area. The last subarea to be considered in connection with Papuasias is Celebes. Here only six species have been collected so far, and of these none are endemic. The species are: as usual, the widespread *D. torta*; *D. Miualiassae*, which is confined to Celebes and the Philippines; *D. ferniginca*, which does not extend to the west of the Wallace line; and three species which do extend to Malaya Proper. These are *D. discolor*, found also in Borneo and reported from the Philippines; *D. parviflora*, which extends from the Philippines and the Moluccas to the Malay Peninsula and Sumatra; and *D. rostrata*, which extends from Celebes to Ceylon and Southern India: there is thus no endemic factor. If all the Papuan species are brought together, we find that, excluding the Philippines, we have nine species, of which four are endemic in the area: if the Philippines be added, we have 14 species, of which nine are endemic—a fairly definite indication of the advisability of treating all these south-eastern subareas, within which the genus is rather poorly represented, as portions of Papuasias. The endemic factor for Papuasias, of $\frac{1}{643}$, exceeds that for China as a whole, but is considerably lower than that for Central and Eastern China. It is noteworthy that, so far, the widespread *D. torta* has not been reported from any of the islands of the Sunda group to the east of the Wallace line; the only species so far reported from these islands is *D. fernigima*, which occurs in Timor.

Malaya Proper, south of Indo-China and west of the Wallace line, is naturally divided into the four subareas of Borneo, the Malay Peninsula, Sumatra, and Java. In Borneo we find 13 species, of which five are endemic. These are *D. falcata*, *D. Beccarii*, *D. Havilandi*, *D. Hoseana*, and *D. borneensis*, so that the endemic factor is $\frac{1}{384}$. Of the remaining eight, one is the widespread *D. torta*; the others, distributed beyond Malayan limits, are *D. discolor*, which goes to Celebes and the Philippines; *D. parviflora*, which is distributed throughout Malaya and passes east as far as the Moluccas and the Philippines; *D. rostrata*, which goes east to Celebes and west to Ceylon and Southern India; *D. iamariadifolva* and *D. veiutina*, both occurring elsewhere in Malaya and extending to Indo-China, the former also reaching the Philippines, South-Western China and the Himalaya; the remaining two Bornean species—*D. pfallanioides* and *D. Scorlchim'i*—are confined to Malaya. In the Malay Peninsula we find 13 species, of which three are endemic. These are *D. HuUctui*; *D. menocides*.

and *D. Eunstkri*. The endemic factor is here therefore $\frac{1}{23}$, or $\frac{1}{23}$. Common to the Malay Peninsula and Sumatra, but not extending elsewhere, we have only two species—*D. Curtisii* and *D. stercoræea*. On the other hand, common to the Peninsula and to Borneo, but not in Sumatra, we have *D. phyllauthoides*; and common to the Malay Peninsula, Java, and Borneo, but not hitherto reported from Sumatra, we have *D. Scortechinii*; this species, though not yet collected in Sumatra, is present in Bangka. The rest of the Peninsular species are of wider distribution. They include *D. velutina*, which goes to Borneo on the one hand and extends to Indo-China on the other, existing not only in Tenasserim, but recurring in Sylhet; *D. tamarindifolia*, which is met with in every part of Malaya Proper, and occurs throughout Indo-China as well as in the Himalaya, South-Western China, and the Philippines; *D. rostrata*, which extends eastward to Celebes, and westward to Southern India; *D. parviflora*, which is everywhere in Malaya and goes east to the Philippines and the Moluccas; *D. latifolia*, Indian, but appearing in the Andamans; finally, the widespread *D. torta*. Sumatra has but six species of *Dalbergia*, and of these only one is subendemic; this is *D. Forbesii*, which, however, occurs also in Lingga. The remaining species are *D. Junghuhnii*, which recurs only in Java; *D. stercoræea* and *D. Curtisii*, which recur only in the Malay Peninsula; *D. parviflora*, which is widespread in Malaya, and extends to the Philippines and the Moluccas; *D. tamarindifolia*, throughout Malaya, Indo-China, the Himalayas, South-Western China, and the Philippines; lastly, the generally-distributed *D. torta*. It is to be observed that *D. rostrata*, which might be expected to occur in Sumatra, has not hitherto been reported from that island. Java, though as rich in species as Sumatra—it must be recollected, however, that Sumatra is not so well explored as Java—has no endemic species. The six *Dalbergias* present are: *D. Juiyjuhiii*, which goes to Sumatra only; *D. Scortechinii*, which goes to the Malay Peninsula and to Borneo; *D. parviflora*, which extends to the rest of Malaya and recurs in Celebes, the Philippines, and the Moluccas; *D. iamarindifolia*, which is found everywhere in Malaya, Indo-China, the Eastern Himalaya, South-Western China, and the Philippines; *D. rostrata*, which extends from Celebes to Southern India; and a species that is here referred to *D. sissoides*, but which may be a form of *D. latifolia*: in either case it extends to India. Here it is to be observed that *D. torta*, so widely spread throughout South-Eastern Asia, has not yet been recorded from the coasts of Java. The only other coasts of which the same is true are those of Coromandel and the Eastern Sunda Islands.

If the four Malayan subareas be treated conjointly, we find that there are 22 species, of which 11 are endemic. The endemic factor thus is $\frac{11}{22}$, or $\frac{1}{2}$ —a figure somewhat lower than the corresponding one for Papuasias, and not much higher than that for China as a whole.

Turning, again, to the divisions of India, we find that in Malabar there are 14 species, four of which are endemic. These are *D. Gardneriana*, *D. rubiginosa*, *D. acaciaefolia*, *D. malabarica*. The endemic factor is thus $\frac{4}{14}$, or $\frac{2}{7}$. Of the distributed species, one (*D. melanoxybn*) is a widely-spread African species, which is frequently planted in India, but appears to be wild in Canara and the Goncan. Of the remaining nine, five occur in Coromandelia. Those that do not appear there are—*D. congesta*, which recurs in Western Indo-China; *D. sissoides*, which recurs in Java; $\frac{1}{2}$, *rostrata*, which is present in Ceylon and spreads from Java to Celebes; and *D. torta*. Of the five which Malabar shares with Coromandelia, one species (*D. muUijlora*) is peculiar to the conjoint area and another (*D. lanccolaria*) is nearly so, as it crosses the

region of India Deserta to the lower Western Himalayan slopes only; it is also present in Ceylon, *D. la tifolia* recurs in the Andamans and the Malay Peninsula, and is more widely distributed under the Himalaya than *D. lanccolaria*; it does not go to Ceylon. *D. paniculata* recurs in Central and Eastern Indo-China; *D. volubilis* occurs throughout the Himalaya, and is equally widespread in Indo-China.

In Coromandelia there is but one endemic species — *D. coromandeliana*, so that the endemic factor is $\frac{1}{16}$, or 16^{-6} . Of the others, four have been mentioned in detail under Malabar; the fifth (*D. spinosa*) is common in the Sundribuns at the head of the Bay of Bengal, occurs on Indo-Chinese coasts, and is reported from those of the Philippines. The degree of isolation for Malabar is low, being little above that for the Malay Peninsula, which does not stand apart from the rest of Malaya; that for Coromandelia is still lower, and the two areas must therefore be taken conjointly. When thus united, the endemic factor for Peninsular India, including Ceylon and the Indian deserts, is only $\frac{1}{35}$, or 35^{-3} —not much higher than the factors for the Philippines and rather lower than that for Borneo.

When the Himalayan and Sub-Himalayan area is considered, we find eleven species with only one (*D. sericea*) absolutely limited to the region. The existence of *D. nricca* is not, however, the full measure of evidence that this Himalayan tract is really a natural area, for *D. Sissoo* is almost as characteristic of the region as *D. sericea*, since it is even more widespread throughout the tract and only overflows westward into the Indian Desert region. However, it seems hardly worth while to recognise as a subarea apart, for this genus, a region with an endemic factor of $\frac{1}{95}$ or only 95^{-1} . The question is, what is the most convenient and least unnatural measure to adopt? The distribution of the remaining species is: *D. lanccolaria*, to India and Ceylon only; *D. latijolia*, throughout India and to the Andamans and the Malay Peninsula; *D. volubilis*, to India and Indo-China equally; *D. rimosa*, to Western Indo-China, South-Western China, and Tongking; *D. confertiflora*, to Western and Central Indo-China; *D. stipidaeca*, to Western, Central and Eastern Indo-China, and to South-Western China; *D. assamica* and *D. mimoloides*, to Western Indo-China and South-Western China; *D. tamarindifolia*, to Western and Central Indo-China and South-West China, passing beyond this to Malaya and the Philippines. Now of those species distributed eastward across the Brahmaputra, all save *D. volubilis* are absent from India, and at the same time are confined to the Eastern Himalaya; while of those found both in the Himalaya and in India, one (*D. lanccolaria*) is confined to the Western Himalaya. The best solution of the difficulty seems to be therefore, to annex the western half of the Himalaya to India and the eastern half to Western Indo-China. This renders our India practically co-extensive with the area occupied by *D. lanccolaria*, and gives it an endemic factor of $\frac{1}{41}$, or 41^{-1} .

In Western Indo-China, between the Brahmaputra and the Irrawaddy, there are 17 species, of which only two are endemic—*D. Wattii* and *D. Thomsoni*. The endemic factor, $\frac{1}{11}$, or 11^{-1} , hardly exceeds that for the Himalaya*. The distributed species are—*D. Kinjiana*, to South-Western China only; *D. conyesta*, to Malabar only; *D. rimosa*, to the Eastern Himalaya, South-Western China, and Tongking; *D. spinosa*, to the coasts of Cochin, Tenasserim, and the Philippines; *D. volubilis*, throughout India, the Himalaya, and Central Indo-China; *D. mimosoides* and *D. assamica*, to the Eastern Himalaya and South-Western China; *D. stipulacea*, *D. confertiflora*, and *D. tamarindifolia*, both to the Eastern Himalaya and to Central Indo-China, the first of these occurring also in South-Western China and Eastern Indo-China, the last of the three extending to South-Western China, the Philippines, and Malaya; *D. rufiformis*

and *D. velutina*, to Central Indo-China, the latter extending to Malaya; *D. lalifolia* throughout India and in the Malay Peninsula; finally, *D. torta*, on almost every coast. If Western Indo-China and the Eastern Himalaya be treated conjointly, we have an area where 19 species, of which 4 are endemic, occur. The factor is thus $\frac{19}{4}$, or 4.75, indicating a degree of isolation smaller than that of Malabar or of Borneo. It would appear as if in the conjoint area of Western Indo-China and the Eastern Himalaya we do not have a region that, as regards *Dalbergia*, is truly natural, but that we have rather a region of overflow, where Central Indo-Chinese, South-Western Chinese, and Indian influences meet. How far this is true will be more apparent when the remaining Indo-Chinese districts are considered.

Central Indo-China, the country between the Irrawaddy and the Meinam rivers, is, so far as we know, the most important subarea in South-Eastern Asia as regards the number of species of *Dalbergia*. Here we have 21 species—almost as many as in the whole of Malaya, fully as many as in Western Indo-China and the Himalaya together. Only 6 of them, however, are endemic; these are *D. obtusifolia*, *D. cultrata*, *D. glomeriflora*, *D. cana*, *D. Kurzii*, and *D. Collettii*. The endemic factor is thus $\frac{6}{21}$, or 0.285—a factor much like that for Malabar. Of the distributed species, *D. Oliveri*, *D. Hemsleyi*, *D. ovata*, *D. foliacea* go only to Eastern Indo-China; *D. fusca* to Eastern Indo-China and South-western China; *D. tamarindifolia* to the Philippines, Malaya, South-Western China, Western Indo-China, and the Himalaya; *D. velutina* to Malaya and to Western Indo-China; *D. parvijlora* to Malaya, the Moluccas and the Philippines; *D. reniformis* only to Western Indo-China; *D. confertiflora* to Western Indo-China and the Eastern Himalaya; *D. stipulacea* to Eastern Indo-China, South-Western China, Western Indo-China and the Himalaya; *D. verticillata* to Western Indo-China, the Himalaya, and India; *D. paniculata* to India generally and to Eastern Indo-China; *D. spinosa* to the coasts of Chittagong, the Sundrivers, Coromandel, and the Philippines; *D. torta* nearly to every coast.

Eastern Indo-China, from the Meinam river to the Chinese Sea, but excluding Tongking, has yielded 16 species. No fewer than eight of these—*D. cochinchinensis*, *D. cambodiani*, *D. Pierricana*, *D. mammon*, *D. Duperreana*, *D. bariensis*, *D. dongnaiensis*, and *D. Godefroyi*—are endemic, so that the endemic factor is $\frac{8}{16}$, or 0.5. Besides the almost ubiquitous *D. torta*, the distributed species are *D. ovata*, *D. foliacea*, *D. Hemsleyi*, and *D. Oliveri*, which go only to Central Indo-China; *D. fusca*, which goes only to Central Indo-China and to South-Western China; *D. paniculata*, which goes to Central Indo-China and recurs in India; finally *D. stipulacea*, which goes to Central and Western Indo-China, to South-Western China and to the Himalaya. The result of uniting Eastern and Central Indo-China is to give an area with 24 species, of which 14 are endemic, so that the endemic factor is $\frac{14}{24}$, or 0.583—a figure much like the factors for China as a whole, for Papuasia as a whole, and for Malaya as a whole.

If the conjoined area of the Eastern Himalaya and Western Indo-China be in turn added to the conjoined area of Central and Eastern Indo-China, we get a region where there are 40 species, of which 22 are endemic, so that the endemic factor is $\frac{22}{40}$, or 0.55. This gives an endemic factor for the whole of Indo-China, lower than the factor for Central and Eastern Indo-China taken conjointly; this suggests that the natural affinity of Western Indo-China is less with the country to the east of the Irrawaddy than with the other adjacent regions.

In order to obtain an area with the highest possible endemic factor, it was necessary to separate South-Western China (Yunnan and Western Szechuen) from the rest of China. The result was the isolation of Eastern China, including Central China

and Tongkiug, with an endemic factor of y^{\wedge} , or $72*7^*$. If South-Western China, with its endemic factor of \wedge^33 , or 23, be united to Indo-China east of the Irrawaday, we obtain a region with an endemic factor of $\bullet\text{§}$, or $57*8$. As this is again a smaller factor than that for Central and Eastern Indo-China taken together, we have to recognise that the natural affinity of South-Western China with the region to the east of the Irrawaday is hardly so great as the affinity of South-Western China with the rest of China, the endemic factor for the whole Chinese Empire being nearly 60. If, however, the district of South-Western China, with its endemic factor of 23, be annexed to the area between the Irrawaday and the Ganges with its endemic factor of 21, we obtain a region where there are 26 species, of which 9 are endemic, and the endemic factor thus becomes $31*6$. This union, giving an endemic percentage higher than that for either of the component parts, is at least justified by results. When in turn we add to the region between the Irrawaday and the Ganges, India to the south and west of the Gangetic plain, we obtain an area where the endemic factor is $\text{£}^?$ or $52*7$. But this factor is still far below that for Eastern China, and it is only when the three regions—India proper; the Himalaya with Assam-Arracan and South-Western China; and Indo-China east of the Irrawaday—are taken conjointly that we obtain a region where the endemic factor of $|\wedge$, or $7cS*8$, somewhat exceeds that for Eastern China.

Similarly, to attain a figure comparable with these factors, it is necessary to unite Malaya and Papuasias, when we get an endemic factor of §§ , or $76*6$, which is more or less intermediate between the factor for India, the Himalaya, South-Western China and Indo-China taken together, and the factor for Eastern China.

Subjoined is given a conspectus of the facts presented in the foregoing paragraphs, in the form of tables showing (1) the distribution of the species of *Dalbergia* throughout South-Eastern Asia, and (2) the endemic percentages of the various subareas, provinces, and sub-subareas:—

TABLE I.—*Distribution of Dalbergia in South-Eastern Asia.*

SrEciEa.	I.—NORTH-BEN.		II.—CENTRAL SUBIXEA.										III.—SOUTHERN SUDAKKA.						REMARKS.					
	(i) China.		(ii) Indo-Himalaya.							(iii) Indo-China.			(iv) Malaya.			(v) Papuaia.								
	E. China, including Tonkin.	O. China.	W. China.	H. China.	H. Siam.	India Deserts.	India.	Ceylon.	Assam-Arracan.	Malaya.	Sumatra.	Java.	Borneo.	Celebes.	Philippines.	Malacca.	Mindanao.	New Guinea.		Australia.	Melanesia.			
	I	1	11	11	II	II	II	II	II	II	II	II	II	II	III	III	III	III		III	III	III	III	
	i	ii	ii	ii	ii	ii	ii	ii	ii	iii	iii	iv	iv	iv	v	v	v	v	v	v	v	in	Sub-areas.	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Provinces.
																								Sub-subareas.
1. <i>D. Albeitisii</i>																								
2. <i>D. Beccaia</i>																								
3. <i>D. Cumingiana</i>																								
4. <i>D. parvilloia</i>											CM													
5. <i>D. apinoia</i>																								
C. <i>D. discolor</i>																								

4. Probably only planted in Tenasserim.
3. Coasts only.

No.	Name	I. - GENERAL SUBREAS.											III. - SOUTH-EAST ASIAN SUBREAS.									REMARKS.		
		(i) China.			(ii) Indo-Chinensis.			(iii) Siam.					(iv) Malaya.			(v) Papuan Is.								
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1	E. China, including Tongking.	I	I	S	I	I	I	I	I	I	a	3	I	I	I	I	I	I	I	I	I	I	I	I
2	C. China.	I	I	S	I	I	I	I	I	I	a	3	I	I	I	I	I	I	I	I	I	I	I	I
3	S.-W. China.	I	I	S	I	I	I	I	I	I	a	3	I	I	I	I	I	I	I	I	I	I	I	I
4	E. Himalaya.	I	I	S	I	I	I	I	I	I	a	3	I	I	I	I	I	I	I	I	I	I	I	I
5	W. Himalaya.	I	I	S	I	I	I	I	I	I	a	3	I	I	I	I	I	I	I	I	I	I	I	I
6	India Peserta.	I	I	S	I	I	I	I	I	I	a	3	I	I	I	I	I	I	I	I	I	I	I	I
7	Malabar.	I	I	S	I	I	I	I	I	I	a	3	I	I	I	I	I	I	I	I	I	I	I	I
8	Ceylon.	I	I	S	I	I	I	I	I	I	a	3	I	I	I	I	I	I	I	I	I	I	I	I
9	Coromandelia.	I	I	S	I	I	I	I	I	I	a	3	I	I	I	I	I	I	I	I	I	I	I	I
10	Assam-Arraeon.	I	I	S	I	I	I	I	I	I	a	3	I	I	I	I	I	I	I	I	I	I	I	I
11	Shan-Tenassenn.	I	I	S	I	I	I	I	I	I	a	3	I	I	I	I	I	I	I	I	I	I	I	I
12	Siam-Cambo-lia.	I	I	S	I	I	I	I	I	I	a	3	I	I	I	I	I	I	I	I	I	I	I	I
13	Malay Peninsula.	I	I	S	I	I	I	I	I	I	a	3	I	I	I	I	I	I	I	I	I	I	I	I
14	Sumatra.	I	I	S	I	I	I	I	I	I	a	3	I	I	I	I	I	I	I	I	I	I	I	I
15	Java.	I	I	S	I	I	I	I	I	I	a	3	I	I	I	I	I	I	I	I	I	I	I	I
16	Borneo.	I	I	S	I	I	I	I	I	I	a	3	I	I	I	I	I	I	I	I	I	I	I	I
17	Celebes.	I	I	S	I	I	I	I	I	I	a	3	I	I	I	I	I	I	I	I	I	I	I	I
18	Philippines.	I	I	S	I	I	I	I	I	I	a	3	I	I	I	I	I	I	I	I	I	I	I	I
19	Moluccas.	I	I	S	I	I	I	I	I	I	a	3	I	I	I	I	I	I	I	I	I	I	I	I
20	Micronesia.	I	I	S	I	I	I	I	I	I	a	3	I	I	I	I	I	I	I	I	I	I	I	I
21	New Guinea.	I	I	S	I	I	I	I	I	I	a	3	I	I	I	I	I	I	I	I	I	I	I	I
22	Australia.	I	I	S	I	I	I	I	I	I	a	3	I	I	I	I	I	I	I	I	I	I	I	I
23	Melanaiia.	I	I	S	I	I	I	I	I	I	a	3	I	I	I	I	I	I	I	I	I	I	I	I
24	Provinces, Subarea.	I	I	S	I	I	I	I	I	I	a	3	I	I	I	I	I	I	I	I	I	I	I	I

39. Coasts only.

40. Doubtful y wild in Java.

41. Widespread in Africa.

42. Doubtfully wild in Java.

TABLE II.—Endemic factors for *Dalbergia* in the various subireae, provinces, and sub-subareas of South-Eastern Asia.

Sub&reas.	Provinces.	Sub-subareas.		
I.—Northern	(i) E. China	B. China, including Touking	9 sp.; F. = 55.5	
		C. China	4 sp.; F. = 25	
		S.-W. Chiaa	13 sp.; F. = 23	
		E. Himalaya	10 Sp; F. = 0	
		W. Himalaya	3 Sp; F. = 0	
	(ii) Inro-Himalayan.	India Deserta	3 Sp; F. = 0	
		Malaba-ia	11 sp.; F. = 23.3	
		Ceylon	3 sp.; F. = 0	
		Coromandelia	6 sp.; F. = 16.6	
		W. Iudu-China (Assira-Arracan)	17 sp.; F. = 7	
I.—Central	(iii) Indo-China	C. Indo-China (Shan-Tenasserim)	21 sp.; F. = 23	
		E. Indo-China (Siam-Anam)	16 sp.; F. = 50	
	(iv) Malaya	Malay Peninsula	13 sp.; F. = 23	
		Sumatra	6 ap.; F. = 16.6	
		JAVA	6 sp.; F. = 0	
	Borneo	13 sp.; F. = 33.3		
	III.—Southern	(v) Papuasia	Celobes	6 sp.; F. = 0
			Philippines	10 sp.; F. = 30
			Moluccas	5 sp.; F. = 20
			Alicron Asia	2 sp.; F. = 0
New Guinea		4 sp.; F. = 25		
Australia		2 sp.; F. = 0		
Melanesia		1 sp.; F. = 0		

In PLATE 2 and PLATE 3, which illustrate this chapter, an attempt has been made to represent graphically the facts expressed in the preceding tables. In these plates the sub-subareas (PLATE 2), provinces (PLATE 3A), and subareas (PLATE 3B) are indicated by circles the areas of which are in proportion to the number of species hitherto collected within each. Sub-subareas within which no endemic species has been found are enclosed in single, the others in double lines. The distribution of individual species is indicated in the series of small maps which occupy PLATE 4.

When the distribution of *Dalbergia* by natural sections is examined, it is found that § *Triplolemea* is only represented in China by a single subendemic group of three species, the ^1 *Mimosoides*, and by *D. rimosa* of the ^f *liimosae*. India too has few species of this section; one of them a coast plant (*D. spinosa*), and three others—two of them, however, endemic,—all of them ^ *PftgUantkoidcs*. Indo-China is still more poorly endowed; east of the Irrawaday we find only the same coast species (*D. spixosa*); west of that river occur *D. spinosa*, one of the Chinese group (^f *Mimosoides*), and two other species, both of them ^ *Rimosae*. Malaya has but one representative of the Indian group ^f *Ikillanthoidcs*; the species is, however, an endemic one; there are, beside?, five endemic ^ [*liimosa**, of which group therefore Malaya is clearly the head-quarters. Two othcT species—/), *discolor* and *D. parviflora*—Malaya shares with Papuasia; another apecica [*D. Beccarii*) is endemic. Papuasia, besides the two species just mentioned, has three endemic ones— *D. Albertisii*, *D. Cumingima* and *D. Mimisdla*. Malaya has thus

7. MALABARIA.

Multiflora, Melanoxydon, Rostrata, Nubieanosa, Torta, Congesta, Gardneriana, Malabarica, Acaciaefolia, Ivatifolia, Sissooides, Paniculata, Lanceolaria, Volubilis.

Sissoo, Latifolia, Lanceolaria.

5. W. HIMALAYA.

Sissoo, Sericea, Lanceolaria.

E. HIMALAYA.

Riniosa, Confertiflora, Sissoo, Tamariidifolia, Latifolia, Sericea, Assamica, Volubilis, Stipulacea.

8. CEYLON.

Rostrata, Torta, Lanceolaria.

15. JAVA.

Parviflora, Jungkahnii, Scoitechinii, Rostrata, Tamarindifolia, Sissooides.

9. GOKOMANDEIA.

Spinosa, Multiflora, Coromandeliana, Latifolia, Paniculata, Ivanceolaria, Volubilis.

3. S.W. CHINA.

Rimosa, Mimosoides, Dyeriana, Yunnanensis, Fusca, Kingiana, Henryana, Tamarindifolia, Burmanica, Polyadelphia, Assamica, Szeinaoensis, Stipulacea.

10. W. INDO-CHINA.

Spinosa, Rimosa, Tiomsoni, Mimosoides, Confertiflora, Kingiaia, Torta, Congesta, Tamarindifolia, Burmanica, Velutina, Latifolia, Assamica, Wattii, Volubilis, Stipulacea, Reniformis.

2. C. CHINA.

Stenophylla, Dyeriana, Huueana, Balansae.

13. MALAY PENINSULA.

Parviflora, Scortechinii, Curtisii, Stercoracea, Phyllanthoides, Hullettif, Rostrata, Menooides, Torta, Tamariidifolia, Velutina, Ivatifolia, Kunsteriana.

14. SUMATRA.

Parviflora, Forbesii, Jungkahnii, Curtisii, Stercoracea, Torta, Tamarindifolia.

1. E. CHINA.

Rimosa, Millettii, Hancei, Benthami, Torta, Tonkinensis, Sacerdotum, Hupeana, Balansae.

16. BORNEO.

Beccarii, Parviflora, Discolor, Scortechinii, Phyllanthoides, Havilandi, Rostrata, Torta, Hoseana, Tamarindifolia, Velutina, Boraensis, Ferruginea, Falcata.

11. C. INDO-CHINA.

Spinosa, Confertiflora, Collettii, Foliacea, Cultrata, Fusca, Torta, Tamarindifolia, Burmanica, Velutina, Obtusifolia, Ovata, Glohieriflora, Faniculata, Oliveri, Hemsleyi, Kurzii, Cana, Volubilis, Stipulacea, Reniformis.

17. CELEBES.

Parviflora, Discolor, Rostrata, Torta, Minahassae, Ferruginea.

18. FHUAPINE.

Ciimingiana, Parviflora, Spinosa, Discolor, Mimosella, Torta, Tamarindifolia, Torta, Ferruginea, Polyphylla, Minahassae, Ferruginea.

12. E. INDO-CHINA.

Foliacea, Fusca, Torta, Pierreana, Ovata, Cambwliana, Cochinchinensis, Paniculata, Oliveri, Hemsleyi, Mammosa, Duperreana, Bariensis, Dongnaiensis, Stipulacea, Godefroyi.

20. MICRONESIA.

Torta, Ferruginea.

19. MOLUCCAS.

Parviflora, Torta, Jaherii, Densa, Ferruginea.

21. NEW GUINEA.

Albertsii, Torta, Ue a, Ferruginea.

22. AUSTRALIA.

Torta, Densa.

23. MELANESIA.

Torta.

A. PROVINCES
OF
S-E ASIA.

(i) E. CHINA.

11 Species, 72.7% endemic

(iii) INDO-CHINA

29 Species, 62% endemic

(ii) INDO-HIMALAYA.

36 Species, 52.7% endemic

(v) PAPUASIA.

14 Species, 84.3% endemic

(iv) MALAYA.

22 Species, 63.6% endemic.

I. NORTHERN SUB-AREA

(E. and S. CHINA.)

11 Species, 72.7% endemic

II. CENTRAL SUB-AREA

(INDIA, HIMALAYA, S.W. CHINA, INDO-CHINA)

52 Species, 76.8% endemic

III. SOUTHERN SUB-AREA

(MALAYA, PAPUASIA)

30 Species, 76.6% endemic

B. SUBAREAS

OF

S-E ASIA.

Dearly twice as many *Triptolemeac* as any other province. When, however, we consider § *Podiogyctaliim*, we find that neither Malaya nor Papuasias possess any species; that India has only one (*D. Sissoo*); that China has three; and Indo-China has four. In this section the species are in every case endemic.

The section § *Endespermum* is in every respect the most widely spread of all the sections, for it has one species (*D. torta*) which occurs in every province, and is present in all but two of the sub-subareas that have a sea-coast. Another species extends to four of the five provinces; this is *D. tamarindifolia*, universal in Indo-China and Malaya and extending to the Philippines, to South-West China, and as far as the Central Himalaya. A third extends to three of the five provinces; this is *D. rostrata*, almost universal in Malaya and extending to Ceylon and Southern India on the one side, to Celebes on the other. Examined by provinces, Eastern China has two, one of them endemic; Indo-China east of the Irrawaday has four, one of them endemic; India proper has seven, four of them endemic; South-Western China, Indo-China west of the Irrawaday and the Himalaya have between them six, two of these being endemic; Malaya has seven, four of them endemic; Papuasias has six, three of them endemic. The section § *Miscobium* is chiefly Indo-Chinese—six species, with four of them endemic; Malaya has three, but only one endemic; Eastern China has one, which is endemic; South-Western China has also one, which is endemic; India has two, but neither of them are endemic; Papuasias has no *Miscobium*. Of species of the section § *Dalbergaria*, however, Papuasias, though it has but two, has both endemic; Malaya is in the same position; China has six, four of them endemic; India has four, but only one of them is endemic; Indo-China west of the Irrawaday, with the Himalaya, has five, of which two are endemic. The focus of this section lies in Indo-China to the east of the Irrawaday, where thirteen *Dalbergariae* (nine of them endemic) are to be met with. The facts are shown more compactly in the subjoined table:—

TABLE III.—*Distribution of the various sections of Dalbergia in South-Eastern Asia.*

GENUS.	SECTION.	NORTHERN AREA.		CENTRAL AREA.						SOUTHERN AREA.			
		E. CHINA.		C. & E. INDO-CHINA.		S.-W. CHINA, V. INDO-CHINA, E. HIMALAYA.		INDIA.		MALAYA.		PAPUASIA.	
		Number of species.	Endemic factor.	Number of species.	Endemic factor.	Number of species.	Endemic factor.	Number of species.	Endemic factor.	Number of species.	Endemic factor.	Number of species.	Endemic factor.
SISSOA	Triptolemea ...	3	06	1	0	4	50	4	50	9	77	5	100
	Pudiopetalum	2	50	5	100	5	20	1	100
AMSRIM- NON.	Endespermum	2	...	4	25	6	33	7	571	7	57	6	60
	Miscobium	...	100	...	83	2	0	2	0	3	33-3
	Dalbergia ...	0	100	13	60	...	50	4	25	2	100	2	100

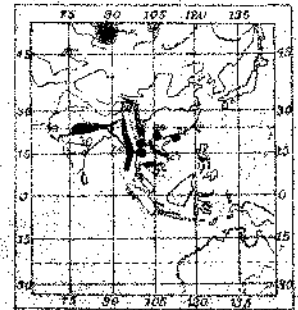
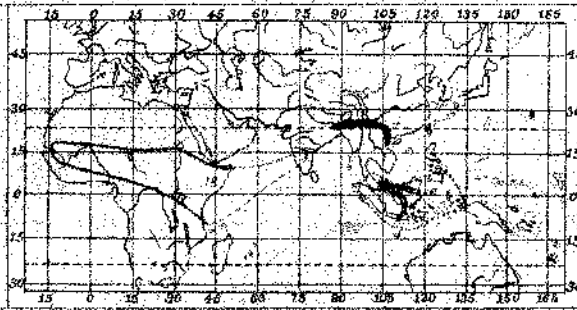
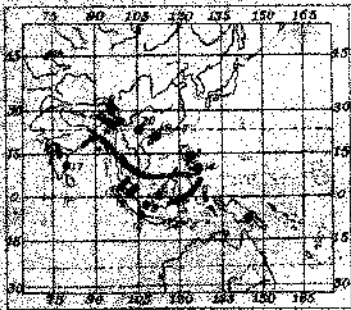
When the distribution of individual species is considered, it will be seen, from the maps on PLATE 4, that they may be readily divided into a large class of localised species and a smaller class of comparatively widely distributed species. In § *Triptolemea*, as the small maps show, we have 14 of the former class as against 7 of the latter. These maps, moreover, show that if we except the littoral species, *Z. spinosa*, which occurs on both sides and at the head of the Bay of Bengal and is again reported from the Philippines, all the *Triptolemeae* of Asia may be arranged in two groups—a northern, including *D. Thomsoni*, *D. rimosa*, *D. Cumingiana*, *D. Mittetii*, *D. mimosoides*, and *D. stenophylla*, extending in a narrow belt from the Eastern Himalaya, across North-West India and Southern

China to the Philippines, with a southern group, which extends from Western and Southern India to Malaya and Papuasia, leaving a wide belt in Northern India and Central and Southern Indo-China without any representative of the section. The section § *Podiopctalum*, on the other hand, more or less occupies this intermediate space, overlapping, it is true, the area belonging to the northern group of *Triptolmeae*, but leaving the area occupied by the southern group quite free. The two most western *Podiopolala* (*D. Sissoo* and *D. confer, tiflora*) are rather widely spread; the remainder are mostly quite localised.

In the section § *Endespermum*, which is not quite so large as *TriptoUmea* or as *Dalbergaria*, we have the same wide diffusion on the part of some of the species, notably on that of *D. torta*, which occurs on every shore except, apparently, those of Coromandel and of Java; of *D. rostrata*, which extends from Southern India throughout Malaya to Papuasia; of *D. tlenscij* which extends from the Moluccas to Australia; and of *D. lamarindifolia*, which is found throughout Malaya, Indo-China, and the Philippines, and extends to South-Western China and the Central Himalaya. Another species, *D. cov.gesta*, has a remarkably dissociated distribution—not, however, a unique feature, since *D. paniculate* among the *Dalbergianæ* exhibits the same peculiarity. The more localised species show the tendency to group themselves in a northern and a southern series of forms that we have already met with in *TripWemw*; Northern India and, save for the presence of *D. tamarindifolia*, Central Indo-China being remarkably free from forms of this section.

The Asiatic *Misclobia*, very like the Asiatic *Podiopolala*, occupy mainly the middle region which the *Triptolemeae* entirely and the *Endcsperma* so largely avoid. With the exception of *D. borneëmis* and *D. polyamplia*, the species of the section § *Misclobium*, though rarely widely distributed, are not very narrowly circumscribed. None of the *Misclobia* extend to Papuasia.

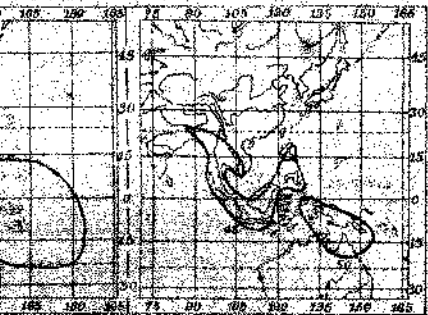
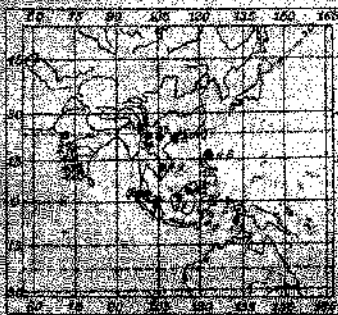
The section § *DMerc/aria*, which may also be divided into a class of localised and a class of widely-diffused species, shows no tendency to segregation into a northern and a southern group, but is fairly uniformly distributed throughout South-Eastern Asia. The widespread species are not, however, quite so numerous as compared with the localised ones, as was the case with *Endespermum* or *Triptolemea*; the most diffused being *D. ferraginea*, which fills Papuasia without, however, touching Australia or Melanesia; *D. lanceolaria*, which is spread throughout India; *B. stipithcea*, which is spread throughout Indo-China; and *D. volubilis*, which practically occupies the whole area filled by the two preceding species. *D. piniculata* has the same dissociated distribution as *D. congesta*. The localised species are chiefly Indo-Chinese and Chinese,



TRIPTOLEMEA

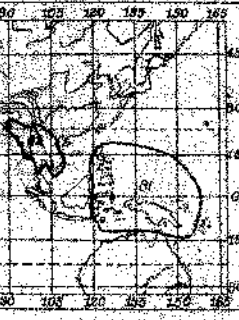
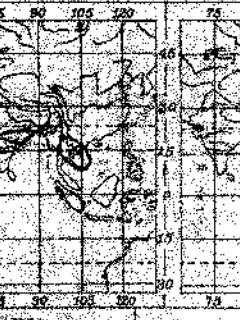
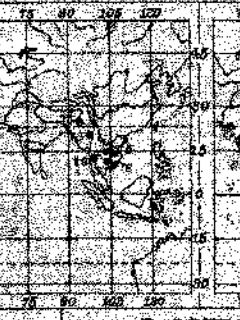
PODIOPERALUM

- | | | | | | | |
|----------------|-----------------|------------------|---------------------|-------------------|--------------|---------------|
| 1. Albertini. | 6. Dissecta. | 11. Scortechium. | 16. Phyllanthoides. | 21. Munosoides. | 22. Rancea. | 27. Peltata. |
| 2. Beccarii. | 7. Rimosia. | 12. Curtisi. | 17. Coccomandiana. | 23. Dyemana. | 23. Dyemana. | 28. Cultrata. |
| 3. Cumingiana. | 8. Forbesii. | 13. Stercoracea. | 18. Malacocorylen. | 24. Conseriflora. | 29. Fusca. | |
| 4. Parviflora. | 9. Tirochensis. | 14. Mimosella. | 19. Milletii. | 25. Yunnanensis. | 30. Siscoo. | |
| 5. Spencea. | 10. Jungkuhii. | 15. Multiflora. | 20. Stenophylla. | 28. Galletii. | | |



ENDESPERMUM

- | | | | | | | |
|---------------|-----------------|----------------|-----------------|-------------------|----------------|------------|
| 31. Hallii. | 34. Kingiana. | 38. Menosides. | 40. Cingata. | 44. Acacioides. | 47. Juhra. | 50. Deppa. |
| 32. Hirsutii. | 35. Henryana. | 39. Tota. | 41. Gardiniana. | 45. Tamaricoides. | 48. Burmanni. | |
| 33. Zosteria. | 36. Beninensis. | | 42. Howiana. | 46. Polyphylla. | 49. Pterocera. | |
| | 37. Rubiginosa. | | 43. Malahana. | | | |



MISCOLOBUM

DALBERGIA

- | | | | | | | |
|-----------------|--------------------|-----------------|------------------|-------------------|-----------------|----------------|
| 51. Yunnan. | 57. Chombrifera. | 62. Sericea. | 68. Minahasana. | 73. Wattii. | 80. Volubilis. | 83. Godeiroi. |
| 52. Borensis. | 58. Lachia. | 63. Sacrodotum. | 69. Olivari. | 74. Mampusa. | 81. Ferruginea. | 84. Pabata. |
| 53. Chindiana. | 59. Siscoo. | 64. Paniculata. | 70. Lancoclaria. | 75. Dupreana. | 82. Stipulosa. | 85. Kunstleri. |
| 54. Ovalis. | 60. Gostachnensis. | 65. Hupeana. | 71. Hamaleyi. | 76. Barinensis. | 83. Benthami. | |
| 55. Javanensis. | 61. Pityrodaphne. | 66. Anamica. | 72. Siamocentra. | 77. Dongnaiensis. | | |
| 56. Caribbiana. | | 67. Balansea. | | 78. Karzli. | | |
| | | | | 79. Cava. | | |

II-CONSPECTUS SYSTEMATICUS.

DALBERGIA LINN. F.

Arbores frutescve, erectae vel alte scandentes. *Folia* alterna, imparipinnata vel rarissime 1-foliolata, stipulis saepius caducis; foliolis alternis, stipellis 0. *Flores* parvi vel minimi, saepius numerosi, in cymas dichotomas **vel** in paniculas subcymosas axillares vel terminales dispositi, bracteis saepissime minimis subpersistentibus, bracteolis saepius minutis caducis rarius persistentibus. *Calyx* campanulatus, dentibus ad normam 5, 2 superioribus latioribus, infimo saepius ceteris longiore. *Corolla* purpurea, violacea, viridiflora, vel alba; vexillo ovato vel orbiculato, saepe emarginato, erecto vel reflexo vel refracto; alis oblongis basi cuneatis vel hastatis; carinae obtusae petalis dorso apice angulato vel rotundato connatis. *Stamina* in vaginam latere superiore fissam omnia connata vel vexillaro rarissime soluto vel saepe omnino deficiente, vel vagina etiam latere inferiore fissam in phalanges 2 laterales disposita; antheribus parvis, erectis, didymis, loculis dorso apposis apice breviter vel rarius longitudinaliter dehiscentibus. *Ovarium* stipitatum, pauciovulatum; stylo incurvo brevi vel brevissimo crasso, vel tenui cylindrico vel subulato; stigmatibus parvis terminalibus. *Fructus* indehiscens, saepissime lomentum samaroidem praeter aream seminiferam tenue, oblongum ovatum vel lineare, nonnunquam omnino incrassatum orbiculare vel falcato-reniforme; saepius medio 1-spermum vel remote oligospermum et saepissime ad senium plus minus reticulatum. *Semina* plano-compressa, reniformia; radícula inflexa.

Species ad 100—120, in America^A Africa et Asia tropica frequentes; species 2—3 in Australia et Polynesia.

SUBGENUS I. SISOA.—*Vexilli lamina erecta; alae basi cuneatae rarius truncatae, rarissime subhastatae; carinae petalis cuneatis vel hastatis; stylo crasso^A cylindrico^A saepius brevissimo; staminibus ad normam monadelphis**

§ 1. **Triptolemea**.—Flores minuti, saepius minutissimi; bracteolis infra calycem saepius persistentibus vel subpersistentibus; inflorescentia saepe dichotome cymosa; petalis omnibus ungue brevibus; stylo semper brevissimo.

§ 2. **Podiopetalum**.—Flores parvi, nonnunquam minuti, bracteolis infra calycem deciduis vel caducis; inflorescentia cymosini paniculata; petalis omnibus ungue longioribus; stylo crasso cylindrico, rarissime perbrevis.

SUBGENUS II. AMERIMNON.—*Vexilli lamina reflexa vel refracta; alae basi hastatae vel sagittatae; carinae petalis hastatis; stylo elongato tenui.*

§ 3. **Endespermum**.—Vexillum plus minus refractum; petalis omnibus ungue angustatis; staminibus ad normam monadelphis; stylo subulato.

§ 4. **Miscobium**.—Vexillum reflexum vix tamen refractum; petalis ungue vexillo cuneato excepto angustatis; staminibus ad normam monadelphis; stylo subulato vel cylindrico.

§ 5. **Dalbergaria**.—Vexillum reflexum vix tamen refractum; petalis ungue vexillo cuneato excepto angustatis; staminibus ad normam isodiadelphis; stylo cylindrico vel subulato.

CONSPECTUS SPECIERUM ASIATICARUM.

§ 1, TJRIPTOLEME1.

- f 1. Nummularieae.—*Legumen orbiculatum omnino incrassatum parum marginatum; frutices scandentes.*
- Foliolis majusculis, acutis, 2-pollicaribus vel majoribus; floribus in paniculis terminales dichotome cymosas dispositis 1.2). *Albertisii.*
- Foliolis parvis, obtusis, seminipollicaribus vel minoribus; floribus in cymis parvas axillares dispositis 2. *D. Beccarii.*
- J 2. Parviflorae.—*Legumen falcatum-subreniforme omnino incrassatum; frutices scandentes,*
- Floribus in paniculis terminales dichotome cymosas dispositis; foliolis versus apicem retusum angustatis:—
- Foliolis subtus adpresso pubescentibus. 3. *D. Cymatocarpa.*
- Foliolis subtus glaberrimis. 4. 1). *parajioia.*
- Floribus in racemos subcymosos axillares dispositis; foliolis apice late rotundatis. 5. 1), *spinosa.*
- J 3. Discolor.—*Legumen samaroideum; floribus in paniculis terminales dichotome cymosas dispositis; arbor erecta.*
- Foliolis majusculis, ultima ultra 2-pollicari, subtus pubescentibus 6. *D. discolor.*
- J 4. Rimosae.—*Legumen samaroideum; floribus in paniculis terminales vel etiam nunquam in axillis superioribus sitas dichotome cymosas dispositis, minutissimis; bracteolis infra calycem persistentibus vel subpersistentibus; frutices scandentes.*
- Leguminibus plus minus oblongis, si subultratis (2). *Thomsoni*, omnino subcoriaceis:—
- Foliolis magnis, ultima ultra 2—3-pollicari:—
- Foliolis obtusis vel acutis, subtus puberulis; legumine ad semina rugoso. 7. *D. rimosa.*
- Foliolis abrupte acuminatis, subtus glabris; legumine ad semina piano. 8. 2). *Forbesii.*
- Foliolis minoribus vel parvis, nunquam ultra 2-pollicaribus:—
- Foliolis subtus glabris:—
- Foliolis 9—11, ovato-oblongis, ultima oeteris majore 9. 2). *Thomsoni*
- Foliolis 11—15, elliptico-oblongis, omnibus subaequalibus 10. 2). *Junghuhnii.*
- Foliolis subtus plus minus puberulis vel pubescentibus:—
- Foliolis 11—15; leguminibus anguste oblongis, rigidis 11. 2). *Scorteohinii.*
- Foliolis 7—9; leguminibus late oblongis, tenuiter coriaceis:—
- Floribus blandis; foliolis fere 2-pollicaribus 12. 2). *Curtisii.*
- Floribus stercoraceis; foliolis minoribus 13. 2). *stercoracca.*
- Leguminibus rotundatis, subultratis, medio prominulis, margine fere membranaceis; foliolis 7 vel parvis: *species stercoracca* 14. 2). *Mimosa-willd.*

- ¶ 5. Phyllanthoides.—*Legumtn samaroideum; floribus in paniculas axillares et/mosas dispositis^ minutis; bracteolis infra calycem deciduis; frutices ecandentes.*

Leguminibus pubescentibus, late-ovatis; oaele armato, ramulis inermibus 15. *D. multiflora.*

Leguminibus glabris:—

Kamulis inermibus; leguminibus late-ovatis 16. *D* phyllanthoides.*

Ramulis spinosis; leguminibus anguste-ovatis:—

Foliis fasciculatis cypisque secus ramulos spinescentes dispositis 17. *D. coromandeliana.*

Foliis sparsis cymisque axillaribus SOD; ius ramulis spinoscentibus distinctis 18. *D. melanoxylon.*

- ¶ 6. Mimosoides.—*Legumen mmmroideum; floribus in racemos axillares dispositis, parvulis; bracteolis iv/ra calycem deciduis; alis subhastatis; frutices scandentes.*

Foliolis subtus glabris; paniculis axillaribus congestis; leguminibus oblongis. 19. *D. Mtiittü.*

Foliolis Bubius pabescentibus; paniculis axillaribus evolutis:—

Leguminibus anguste oblongis; foliolis tandem, nervo mediano excepto, eubtus glabris. 20. *D. sfenophylla.*

Legumicibus oblongis; foliolis subtus adpresse puberulis . . . 21. *D. mimowids.*

§ 2 PODIOPETALUM.

- ¶ 7. Foliaceae.—*Legumen samaroidum; foliolis cblusis; alis basi cuncatis; carinae peialis latere superiors basi ha%lath; stylo cylindrieo crassiorc; bracteolis infra calycem obtusis brcvibus; frutices scandentes.*

Floribus in paniculas axillares dispositis:—

Foliolis nunquam longitudine pollicaribus 22. 2), *Hancei.*

Foliolis loDgitudine saltern pollicaribus 23. *D. Dyeriana.*

Floribus in paniculas terminales nonnunquam ctiam in axillis euperioribus dispositis:—

Leguminibus ad seniina planis, ibique parum reticulatis . . . 24. *D. confertiflora.*

Leguminibus ad semiDa rugosis, ibique magnopere reticulatis:—

Paniculis terminalibus atque simul ad axillas summas extensis; foliolis 13 vel pluribus, ultima ceteris haud maj ore:—

Calycis dentibus omnibus obtusis 25. *Z. yunnanensis.*

Calycis dente inferiore ceteris longiore, acuto . . . * 26. *D. Coliettiü*

Paniculis omnibus terminalibus; foliolis ssepius 7, nunquam ultra 11, ultima manifeste ceteris majore . . . 27. *D. foliacea.*

- ¶ 8. Cultratae.—*Legumen samarcAdeum, oblongum; foliolis obtusis; floribus in paniculas axillares disposilis; alis basi cuncatis; carina peialis latere superiore basi hastaiis; stylo cylindrieo crassiore; bracteolis infra calycem subuhlis brevibus; arbores elaitTe**

Foliolis subtus glaberrimis. 28, *D. cultrala**

Foliolis subtus adpresse pubescentibus. 29. *D. fusca.*

- ¶ 9. Sissoo.—*Legumen tataroidenm, anguste ligulatum; foliolis acuminatis; alis carinae-que petalis cuneatis; stylo brevissimo, crasso; bracteolis infra calycem obtusis, majusculis, calycem aequantibm; arbor data.*

Floribus in paniculas axillares dispositis. 30. J)% *Sissoo.*

§ 3. ENDESPERMUM.

- ^J 10. Rostratae.—*Legumen samaroideum, latius ligulatum; foliolis paucis majusculis; bracteolis infra calycem subulatis, brevibus, caducissimis; frutices scandentes vel arbores parvae.*
- Ovario stipite excepto glabro 31. 2). *Hullettii*.
 Ovario puberulo vel pubescente :—
 Foliolis pubescentibus, obtusis 32. *D. Havilandi*.
 Foliolis glabris, acumioatis 33. *D. rostrata*.
- *[11. Kubigincaes.—*Legumen samaroideum, oblongum; foliolis majusculis vel inaequalibus, paucis; bracteolis infra calycem obtusis; frutices scandentes vel arbores parvae.*
- Foliolis acutis:—
 Foliolis 7—9, subtus tandem fere glabris; ovario glabro . . . 34. *D. Eingiam*.
 Foliolis 4—5, subtus pubescentibus; ovario pubescentia . . . 35. *D. Hennjana*,
 Foliolis obtusis:—
 Foliolis 5—7, versus apicem obtusius angustatis . . . 36. *J. Benthumi*.
 Foliolis 3—5, apice lato obtusis 37. *D. rubiginosa*,
- «} 12. Menoecides.—*Legumen falcato-subreniforme, omnino incrassatum; foliolis paucis; bracteolis infra calycem obtusis; frutices scandentes.*
- Foliolis 3, acutis, majusculis, 3-pollicaribus 38. *D. menoecides*.
 Foliolis 5, rarissime 3 vel 7, obtusis, minoribus, vix 2-pollicaribus 39. *D. torta*.
- ^ 13. Congestae.—*Legumen samaroideum, ovatum; foliolis mediocribus vel minoribus, paucis vel numerosis; frutices scandentes.*
- Foliolis basi cuneatis, apice retusis 40. *D. congesta*.
 Foliolis basi apiceque rotundatis :—
 Foliolis 7—13 :—
 Cymis congestis; foliolis 7 — 11.....41. *D. Gardneriana*.
 Oymis laxis; foliolis 9-13 42. *Z. Hoscana*.
 Foliolis 21-31. 43. *Z. molabarka*.
- % 14. Polyphyllae.—*Legumen samaroideum, angustius ligulatum; foliolis parvis rariis mediocribus, saepissime numerosis; frutices scandentes vel arbores parvae.*
- Foliolis basi distincte obliquis, latere superiore rhombeis, inferiore cuneatis:—
 Foliolis subtus glaucescentibus; leguminiibus rigide coriaceis 44. 2). *acaciaefolia*.
 Foliolis subtus viridibus; leguminiibus tenuiter coriaceis . 45. 1). *tamirindifolia*.
 Foliolis basi parum obliquis:—
 Foliolis vix semipollicaribus 46. *Z. polyphylla*.
 Foliolis ultra semipollicaribus :—
 Vexilli laminaaequilonga ac lata; bracteis lanceolatis :—
 Foliolis glabris vel sparse puberulis : •—
 Foliolis vix pollicaribus > . 47. *D. Jaherii*.
 Foliolis ultra pollicaribus 13. *D. burmanica*.
 Foliolis utrinque et praeeertim subtus dense velutinis . . 49. *D. Pierreana*.
 Vexilli laminae quam lata longiore; bracteis bracteolaeque obtusis; foliolis mediocribus vel majusculis . . 50. *D. densa*.

§ 4. MISCOLOBIUM.

- *] 15. Velutinae.—*Legumen sarnaroideum, oblongum; foliis mediocribus vel parvis; bracteolis infra calycem obtusis, calyce brevioribus; stylo mbulato; fruiices scandentes.*
- Foliolis 13—17. 51. *D. vtulina.*
Foliolis 7—9. 52. *D. borneënsis.*
- *] 16. Ovatae.—*Legumen samaroideum, ovato-oblongum vel oblongum vel subligulatum; foliolis majusculis; bracteolis infra calycem obtusis, calyce brevioribus; stylo gracili cylindrico; arbor'es elalae.*
- Foliolis obtusis; legamen oblongum 53. *D. obta-sifulia.*
Foliolis acutis vel acuminatis:—
Paniculis dense congestis. 51. *D. gkmeriflora.*
Paniculis laxis:—
Foliolis 7 vel paucioribus:—
Legumen oblongum 55. *Z). ovata.*
Legumen subligulatum. 56. *D. cambodiani.*
Foliolis 8 vel pluribus; legumen ovato-oblongum 57. *D. tomrinensis.*
-] 17. Latifoliae.—*Legumen samaroideum, oblongum vel oblongo-lanceolatum vel subligulatum; foliolis majusculis / bracteolis infra calycem obtusis, calycem aequantibus vel subaequantibus; stylo gracili, cylindrico; arbores elalae.*
- Floribus in panioulas laterales dispositis; foliolis obtusis vel retusis; legumine oblongo. 58. *D. latifolia.*
Floribus in paniculas terminates dispositis; legumine oblongo-lanceolato vel subligulato:—
Foliolis acutis vel subacutis; legumine oblongo-lanceolato. 59. *D. sissoiJes.*
Foliolis acutia vel acuminatis; legumine subligulato . . . 60. *D. cochlnchiJiensis.*
- *] 18. Polyadelphia.—*Legumen samaroidctim, oblongo-lanceolatum; foliolis mediocribus vel parvis; bracteolis infra calycem lanceolatis, calyce brevioribus; stylo subulato; arbor mediocribus.*
- Foliolis acutis, subtuu glaucescentibus; staminibus polyadelphis 61. *D. poly a .elpha.*

§ 5. DALBEEGARIA.

- ^] 19. Sericeae.—*Legumen sarnwoideum, anguste ligulatum; foliolis obtusis; stylo cylindrico; arbores elalae.*
- Floribus in paniculaa laterales dispositis; stipulis lanceolatis. 62. *D. sericca.*
Floribus in paniculas terminates dispositis; stipulis spathulatia 63. *D. sacerdotum.*
- ^] 20. Lanceolariae.—*Legumen somaroideum, late ligulatum vel ovato-lanceolatum; foliolis obtusis; stylo gracili, cylindrico; arbores elafac**
- Floribus in paniculas vere terminates dispositis:—
Paniculis densioribus; calycis dente inferiore lateralea vix excedente. 64. *D. paniculata.*
Paniculis laxis; calycis dente inferiore lateralibus duplQ longiore. 65. *D. hupeang.*

Floribus in paniculas axillares TCI infra-axillares dispositis : —

Floribus foliisque coetaneis :—

Calycis dentibus superioribus subrefbxis 66. D. *assamica*.

Calycis dentibus superioribus erectis: —

Foliolis 13—15. 67. D. *Balansae*.

Foliolis 17-25:—

Stipulis parvulis angusto lanceolatis; foliolis junioribus

sparse puberulis. 68. Z). *Minahasiac*

Stipulis magnis foliaceis oblongis obtusis; foliolis

junioribus dense sericels. 69. 2). *szemaocnsu*.

Floribus quam folia prius evoluiis:—

Foliis ad apicem axis floriferi evolutis. 70. D. *Oliveri*.

Foliis infra ramos axis floriferi evolutis:—

Yexillo supra basin calloso; foliolis sublus cito glabres-

centibus. 71. 2). *lanceolaria*.

Yexillo haud calloso; foliolis sublus pubescentibus . . . 72. D. *Hemslayi*.

*j| 21. *Canae*. *Legumen samaroidcum, late Ugilalum; foliolis acutis vel subacutis; stylo snhdato; arlorcs eUrfae.*

Foliolorum marginibus revolutis; legumiinibus glabria 73. D. *WatHi*.

Foliolorum marginibus baud revolutis:—

Leguminibus glabris :—

Leguminibus ad 6eraina umbonatis; paniculis teriainalibus . 74. D. *nwmmsa*.

Legumiinibus baud umbonatis :—

Paniculis terminalibus :—

Foliolis vix 2-pollicaribus, ipso apice retnsis 75. D. *barienim*.

Foliolis 2-pollicaribus vel ultra 2-pollicaribus, apice acutis:—

Foliolis oblongis, basi xotundatis. 76. D. *dungnaiensis*.

Foliolis angustis, basi cuncais. 77. D. *Dupcrreana*.

Paniculis axillaribus. 78. J). *Kvrzii*.

Leguminibus dense velutinis; paniculis axillaribus 79. D. *tana*.

^T 22. *Volubilis*, *Legumen samaroiJeum, temie^ oblcnjum; foliolis obhsis; stylo breviorc, cra&siorc, cylindrico; frutex scandens.*

Floribus in paniculas terminales dispositis; bracteis majus-

culis. 80. D. *vobubilis*.

f| 23* *Stipulaceae*. *Legumen samaroidcum, plus minus ad semina incrassatum; foliolis obtusis; stylo subulato; frvtijcs scandentis vel ereciae; bracieis majusculis obiusis.*

Leguminibus ad semina parum incrassatis; ovario hirsuto . . . 81. D. *ferruginea**

Leguminibus ad semina magnopere incrassatis; ovario, stipite

hirsuto excepto, glabro. 82. D. *stipulacea*.

¶ 24. *Reniformes*. *Legumen falcato-subreniformc, omimmo incrassaium; stylo subulato; arbores ehtae, vel fruticcs erecti vel scandentcs.*

Foliolis minoribus obtusis, rarius ultra pollicaribus; scandens . 83. D. *Godefroyi*.

Foliolis majoribus vel majusculis:—

Leguminibus planis; frutices scandentes:—

Mesocarpi leguminis tenuiter suberoso. 84. D. *falcata*.

Mesocarpi^ leguminis crasse suberoso. 85. D. *Kunstkri*.

Leguminibus verrucosis; mesocarpi crasse suberoso;

arbor erecta 86. D. *renjformis*.

III-DESCRIPTIONS OF THE ASIATIC SPECIES OF DALBERGIA,

DALBERGIA LINN. F.

- AMERIMNON P. Br. Hist. Jamaic. 288 (1756).
 ECASTAPHYLLUM P. Br. Hist. Jamaic. 299 (1756).
 PTEUCARPUS Berg. Vet. Acad. Handl. Stockh. 116 (1769); Poiret Encyc. Moth. v. (1801) and Encyc. Meth. Suppl. iv. (1816) in part, not of Linn.
 ACOUROA Aubl. Pl. Guian. 753 t. 301 (1775).
 DALBEUGIA Linn. f. Suppl. PL 52 (1781).
 DRAKENSTEINSIA Neck. Elem. iii. 33 (1790).
 ENDESPERMUM Bl. Cat. Gew. Buitenz. 23 (1823).
 SEMEIONOTIS Schott Wien. Zeitschr. iii. 804 (1829).
 HEOASTOPHYLLUM H. B. & K. Nor. Gen. et Sp. vi. 387 (1834).
 MISCOLOBIUM Vog. Linnsea xi. 200 (1837).
 TRIPTOLEMEA Mart. FloLa xx. Beibl. 122 (1837).
 LEIOLOBIUM Benth. Ann. Wien. Mus. ii. 91 (1868).
 PODIOPETALUM Hochst. Flora xxiv, 657 (1811).
 DKEPANOCARPUS Kurz Pegu Rep. App. A. 49, B. 45 (1875); Journ. As. Soc. Beng. xlv. 281 (1876); For. Flor. Burin, i. 336 (1877), not of G. W. F. Mey.

Trees or large climbing shrubs. *Leaves* alternate, unequally pinnate, rarely 1-foliolate; stipules various, often small and usually deciduous; leaflets alternate, very rarely some of them subopposite; stipels 0. *Flowers* small or very small, usually numerous, white or rarely purple or violet, in dichotomous cymes or *in* subcymose axillary or terminal panicles; bracts very small, often persistent; bracteoles usually very small, generally deciduous. *Calyx* campanulate, 5-toothed; the lowest tooth usually the longest, the upper pair usually wider than the rest and often partially connate. *Corolla* papilionaceous; the standard ovate or oblong or orbicular, usually notched at the apex, its claw long or short; wings oblong, cuneate truncate or hastate at the base of the blade, claws usually long; keel-petals obtuse, always more or less connate at the apex behind, claws long, base of blade usually unilaterally hastate. *Stamens* 10 or 9, usually connate in a single sheath slit on upper side, occasionally in two lateral bundles of 5 each, sometimes with only 4 on each side, and the vexillary stamen almost or quite free, very rarely 9 in a sheath below with a free vexillary filament; anthers small, erect, didymous, cells placed back to back; dehiscence by short apical, rarely by longitudinal chinks. *Ovary* stipitate; style slender or stout, long or short, usually incurved; stigma small terminal; ovules few. *Fruit* an indehiscent lomentum, usually oblong or linear, saaiaroid, slightly rarely greatly thickened and usually reticulated opposite the median solitary or the discrete 2 or more seeds, elsewhere flat and thin, but neither margined nor winged; rarely falcate and slightly or considerably thickened throughout, but not margined; very rarely orbicular or suborbicular and thickened throughout, slightly margined along the upper surface. *Seed* reniform, compressed; radicle indexed.

SUBGEUNS I.—SISSOA.

Flowers with standard-blade erect; wings cuneate, rarely truncate, very rarely slightly hastate at junction of blade and claw; keel-petals cuneate or hastate; style cylindrical, stout, often very short; stamens normally monadelphous.

The large primary group *Sissoa* is a fairly natural subdivision, and it can hardly be said that any of the groups that go to compose it, if we except the group *Sissoj* itself, bear a striking resemblance to any of the groups of *Amerimnon*. In the case of the exception mentioned, there is a curious similarity between *Sissoo* and the *Litifoliae*, since both have very large epicalycine bracteoles, quite covering the calyx till such time as they fall off. But except for this one character, and for the fact that, like *D. latifolia*, *D. Sissoo* is a *Dalbergia* and is a tree, the affinity between the two, so generally claimed in botanical treatises, is imaginary rather than real. The only group in which the best artificial character, that of cuneate wing-blades, breaks down is in the group *Mimosoides*, where the species in other respects are decisively *Triptolemeae* and have no great affinity with any species in *Amerimnon*. The pods of one of the groups, *Parviflorae*, are, it is true, very like the pods of the groups *Menooides* and *Reniformes*, but it is possible that similarity of pod throughout the genus is a feature more extrinsic than intrinsic; it is one that, to say the least, cannot be relied on as a taxonomic guide, and when the sum total of the characters exhibited by the various *Dalbergios* is considered, is one that it would be safer to neglect entirely than to treat as crucial. It is, however, one that it is convenient to use, with care, as a subordinate aid in classification. As an aid to specific identification, it is, perhaps because it is trivial, of considerable value.

§ 1. **TRIPTOLEMEA.**—Flowers usually minute, always very small; epicalycine bracteoles often persistent or subpersistent; inflorescence usually distinctly cymose; claws of all petals, especially of the standard, very short; style very short.

The section *Triptolemea* is a useful one to recognise within the wider group *Sissoa*, but it is not naturally separable from the section *Podiopetalu/n*, since the two pass into each other at various points; nor is it even easily artificially distinguished because every individual character breaks down. The best marks of a *Triptolemea* are the short style, the smaller flowers and persistent bracteoles, and the very short standard-claw. The flowers of some of the *Podiopetali*, however, are as small as those of some genuine *Triptolemeae*; most striking deviation of all, the style of *D. Sissoo*, the largest flowered of the *Podiopstala*, is short as in the *Triptolemeae*.

5J 1. **Nummularieae.**—*Pod suborbicuhr, thickened throughout, and more or less distinctly margined; climbers.*

This is not quite a natural group, owing to the great difference in the foliage of the two members. Except as regards the pod, *D. Albertisii* seems very nearly related to *D. parviflora* of the *Parviflorae*, and to *D. rimosa* of the *Rimosae*; while, except as regards its pod, *D. Beccarii* is obviously very nearly related to the group *Phyllanthoide**. As regards pod, on the other hand, both species must be, to those who continue to recognise the artificial and unnecessary genus *Ecastaphyllum*, members of that genus.* The remaining *Eoasiaphylla* are African and American, and are referable to *Amerimnon* § *Dalberyaria*, not to *Sissoa*; it is of course just possible, since the stamens of *D. Albertisii* are not yet known, that it too may have to be referred to that section; but it is unlikely, because the large terminal panicles of dichotomous cymes are so thoroughly in keeping with the characteristics of the remaining *Triptolemeae*. The *Ecastaphylla* of the section § *Dalbergaria* form a natural group to which the name *Monetarieae* may be applied.

* Spelling more properly *Ecastaphyllum* or, Twik purists, *Eicastaphyllum*.

1. DALBERGIA ALBERTISII Prain Journ. As. Soc. Beng. Ixx. 2, 62 (1901).

A climbing shrub, young branches terete, *Leaves* 9—10 in. long; leaflets 8—9, very dark-green, and quite glabrous above, paler and glabrous or minutely adpressed-puberulous beneath, firmly coriaceous; midrib impressed above, prominent beneath, secondary nerves rather numerous, ovate-acute with rounded base, terminal rather the largest, 2—2'25 in. long, 1*25 in. wide; rachis 5*5—6'5 in. long, and short petiolules glabrous. *Flowers* minute, secund, in ample terminal thyrsoid panicles with sparsely pubescent zigzag rachis 5 in. long, giving off at each angle stoutish horizontal branches 1 in. long, dividing at their apices into 2 or more reflexed cyme-branches; bracts and bracteoles deciduous; *calyx* campanulate, teeth short obtuse; *corolla* and *stamens* not seen. *Pod* indehiscent, thin, membranous, green, suborbicular, apiculate and 1-seeded, rarely oblong and 2-seeded, slightly cuneate at the base, 2—1*5 in. long, '75 in. wide, distinctly stipitate, finely wide-reticulate throughout, with a firm narrow margin, finely lepidote-puberulous,

PAPUASIA: New Guinea; Fly River, *Valberitsl*

This species, if the genus *Ecastaphyllum* be sustained, must be known as *Ecastaphyllum Albertisii*. As Benthara has, however, pointed out, *Ecastaphyllum* is a purely artificial group.

PLATE 5. *Dalbergia Albertisii* Prain.—1, Fruiting specimen from Fly River, New Guinea, *n. s.*; 2, pod, opened, showing young seed *in situ*, *n. s.*; 3, young seed X 4; 4, young seed, in section X 4.

2. DALBEGIA BECCARII Prain Journ. As. Soc. Beng. Ixx. 2, 6± (1901).

Ormocarpum scandens Teysm. ex Prain Journ. As. Soc. Beng. Ixx. 2, 61 (1901).

A climbing shrub, with slender, terete, densely finely pubescent branchlets. *Leaves* sub-bifarious, 1*5—1-75 in. long; leaflets 11—17, small, close-set, oblong, slightly retuse at apex, dark-green above, rather paler beneath, finely pubescent on both surfaces, *4 in. long, *2 in. wide; rachis 1—1*5 in. long and very short petiolules puberulous; stipules minute, lanceolate. *Flowers* very minute, secund, in small cymes in the lower leaf-axils, *3 in. long, peduncles and short pedicels puberulous; bracts and bracteoles deciduous, very small, ovate; *calyx* campanulate, teeth small, two upper subconnate, obtuse, lateral acute, lowest lanceolate; *corolla* not seen; *stamens* 9, in one sheath split along upper side, the ob vexillary filament more deeply separated than the lateral groups of 4 each, which are free in their upper third and alternately shorter and longer; *ovary* not seen. *Pod* small, irregularly ovate, apiculate, glabrous, coriaceous and firm, distinctly stipitate, pale-brown, 1-seeded, thickened and faintly reticulated opposite the seed, -6 in. long, '4 in. wide; *seed* reniform, '3 in. long, *2 in. wide, testa blackish, somewhat shining.

MALAYA: Borneo; Kuching, *Beccarii* Kapuas, *Teysmannl*

This species is also an *Ecastaphyllum* (*E. Beccarii*) for those who prefer to retain that artificial genus.

PLATE CA. *Dalbergia Beccarii* Prain.—1, Branch of *Dalbergia Beccarii* from Kuching, Borneo, *n. s.*; 2, calyx, laid open and epicalycino bracteoles X 4; 3, basal bracteoles X 4; 4, stamens X 4; 5, seed, *n. s.*

U 2. Parviflorae.—*Pod falcate-sulreniform, thickened throughout, not margined; climbers.*

Like the preceding, this is anything but a natural group. The first two species, which are abundantly distinct, were treated by Benth as varieties of one. Benth had no pods of either: he did not observe that the second species of the group is identical with *D. parviflora*, which he kept up tentatively as distinct; and still more remarkably, in spite of the fact that Roxburgh's description of *D. parviflora*, meagre though it be, indicates that *D. parviflora* cannot possibly be anything but a *Selenolobium*, Benth has referred these to his § *Triptolemea*. That in this Benth was right the writer is assured, but the action does not conform exactly with the scheme of classification that is being given effect to in *Journ. Linn. Soc. iv. Suppl.* Even yet the pod of *D. Cumingiana* is unknown, and it may well prove ultimately to be, as Benth's note suggests, nearly related to *D. rimosa*, though it certainly is not a variety of that species. *D. parviflora* is, but for its pod, also one of the *Rimosae* group > *D. spinosa*, on the other hand, is, but for its pod, rather one of the *Phyllanthoides* group.

3. DALBERGIA CCMINGIANA Benth. PL Jungh. i. 255 (1851); Miq. Flor. Ind. Bat. i. 1, 129 (1855); Nav. & Fernand. Vill. Nov. App. Flor. Philip. 67 (1880); Vidal Phan. Cum. Philip. 42 (1885); Plant. Vase. Filip. III (1886).

D. Cumingii Benth. Journ. Linn. Soc. iv. Suppl. 32 VAR. *typica* only (1860).

Dalbergia sp. Vidal Plant. Vase. Filip. 112 in part (1886).

A woody climber with lenticelled branches and puberulous branchlets. *Leaves* fi-5 — 4 in. long; leaflets 7—9, ovate, apex obtuse emarginate, base cuneate or rounded, glabrous above, uniformly adpressed-pubescent beneath, finely reticulate-veined, '75—1*75 in. long, #4 — 1 in. wide; rachis 2—2 5 in. long, puberulous as are the short petiolules. *Flowers* minute, secund, in terminal thyrsoid panicles extending into the axils of the upper leaves, 6 in. long, 2 in. wide; rachis, branches and pedicels puberulous; Lracteoles ovate, persistent; *calyx* campanulate, teeth obtuse or subacute, the lowest somewhat the longest; *corolla* white, petals short-clawed, standard wide-ovate, slightly emarginate; *stamens* 10, in one sheath split along upper side; *ovary* glabrous, stylo short; *ovules* usually 2. *Pod* not seen ripe, when young resembling that of *D. parviflora*.

PHILIPPINES: Luzon; Albay, *Cuming*] Iriga, *Vidal*] Pili, *Vidal I* Catarman; Samar, *Vidal!*

As ripe fruit of this is not yet known, it is uncertain whether it has a *Selenolobium* pod.

PLATE 7. *Dalbergia Cumingiana* Benth.—1, Flowering branch from Albay, Luzon (*Cuming* 1244), *n. s.*; 2, calyx, laid open X 4; 3, standard X 4; 4, wings X 4; 5, keel-petals X 4; 6, stamens X 4; 7, ovary, developing into fruit, *n. s.*; 8, the same opened, *n. s.*

4. DALBERGIA PARVIPLORA Eoxb. Hort. Beng. 98 (1814); Flor. Ind. iii. 225 (1832); Miq. Flor. Ind. Bat. i. 1, 102 (1855); Benth, Journ. Linn. Soc. iv. Suppl. 33 (1860); Prain Journ. As. Soc. Beng. lxxvi. 2, 121 in part (1897); lxx. 2, 63 (1901); Becc. Nello Foreste di Borneo 358, 591, (1902).

D. parviflora Benth. PI. Jungh. I. 255 (1851).

D. corymbifera Bl. ex Miq. Flor. Ind. Cat. i. 1, 130 (1855).

D. Zollingeriana Miq. Flor. Ind. Bat. i. 1, 130 (1855); Hassk. Neuer SchK Rumph. 90 (1864); Nav. & Fernand. Vill. Nov. App. Flor. Philip. 67 (1880).

D. Cumingii VAR. *Zollingeriana* Benth. Journ. Linn. Soc. iv. Suppl. 32 (1860). *JDrepanocarpus Cumingii* Kurz Journ. As. Soc. BeDg. xlv. 2, 282 (1876); For. Flor. Burm. i. 336 (1877).

Lacca lignum Rumpb. Herb. Amboin. v. 17 t. 13 (1750).

A strong climber, 30—80 feet long, with lenticelled branches, the main stem armed with woody branching spines; branchlets quite glabrous. *Leaves* 6—8 in. long, leaflets 5—9, ovate-lanceolate, with narrowed but obtuse, slightly emarginate apex, base wide-cuneate or rounded; light-green, quite glabrous on both surfaces, finely reticulately veined, 2—3½ in. long, 75—150 in. wide; rachis 2—3 in. long and short petiolules glabrous. *Flowers* minute, secund, in terminal panicles extending into the axils of the uppermost leaves, 1½—4 in. long, 3—5 in. wide; peduncles glabrous, branches and short pedicels puberulous; bracteoles ovate, ciliate, persistent, the epicalycino pair embracing lower third of calyx-tube; *calyx* campanulate, teeth obtuse, the upper two subconnate rather wide, the lower rather longer than the lateral pair; *corolla* white, petals short-clawed, standard rather narrowly obovate, emarginate; *stamens* 10, in one sheath split along upper side, the vexillary filament rather shorter than and more free than the others; *ovary* glabrous except for a few hairs on suture, stout; style short, stigma small; *ovules* usually three. *Pod* indehiscent, turgid, 1—3-seeded, when young falcate along upper, when ripe convex on both sutures; when more than one-seeded torulose; quite glabrous, 75—200 in. long, 6 in. wide; *seed* wide-reniform, 5 in. long, 35 in. wide.

INDO-CHINA: Tenasserim; in clearings in gardens, *Heifer* MALAYA: Peninsula; Dindings, *Curtis*! Perak, *Wray*! *Eunstler*! Pahang, *Ridley*! Sumatra; *Zollinger* *X* *Teysmann*! Java; *Blumel* Borneo; Sarawak, at Bintulu, Sungei Maban and Santubong, *Beccaril* Celebes; *Zollinger*! Moluccas; Halmahera, *Teysmann*! Ambonia, *C. Smith*! PHILIPPINES: Luzon, *Naves* *Sf Fernandez Villar*.

This climbing species, known to the Malays as Acor Berangan, yields the *Kayoe Lelcka* of commerce, which consists of the old dead heartwood from which the alburnum has been removed; it is used as incense, with other odoriferous woods, by the Chinese. The Philippine record for *Uia* species requires verification.

PLATE 8. *Dalbergia parviflora* Roxb.—1, Flowering branch from Perak, *n. s.*; 2, bud X 4; 3, calyx, laid open X 4; 4, standard X 4; 5, wings X 4; 6, keel-petala X 4; 7, stamens X 4; 8, ovary X 4; 9, ovary opened X 4; 10, ovule X 10; 11, young fruit, from Perak, *n. s.*; 12, the same opened, seeds hardly developed, *n. s.*; 13, twig with ripe fruits from Halmahera, *n. s.*; 14, ripe fruit opened, showing seed *in situ*, *n. s.*; 15, seed, *n. s.*

50 DALBERGIA SPINOSA Roxb. Hort. Beng. 98 (1814); Flor. Ind. iii. 226 (1832); Voigt. Hort. Suburb. Calcutta 241 (1845); Benth. PI. Jungh i. 250 (1851); Journ. Linn. Soc. iv. Suppl. 49 partly (1860); Bak. in Hook. f. Flor. Brit. Ind. ii. 238 (1876); Nav. & Fernand. Vill. Nov. App. Flor. Philip. 67 (1880); Talbot Bomb. List 75 (1894); Prain Journ. As. Soc. Beng. Ixs. 2, 64 (1901); Cooke Flor. Pres. Bomb. i. 400 (1902); Prain Bengal Plants 411 (1903).

D. horri Ja Grab, in Wall Cat. 5877 (1832), not *Ammeri-num horrvium* Dentist.
Drepanocarpus spinosus Kurz Journ. As. Soc. Beng. xlv. 2, 281 (1876); For.
 Flor. B uim. i. 37 (1877).

A large shrub, often climbing and generally with the smaller branches converted into straight pungent spines, sometimes with branches twisted and hooked; branchlets glabrous. *Leaves* 15—25 in. long, scattered or, on the spines, fascicled; leaflets 5—9, ovate, obtuse or retuse, base rounded, quite glabrous, 4—7 in. long, 2—5 in. wide; rachis 6—15 in. long, and short petiolules glabrous. *Flowers* small, white, in axillary racemes, less often in few-branched panicles, 1—1.5 in. long; peduncles and long pedicels glabrous; bracteoles ovate, epicalycine pair embracing lower half of calyx-tube, very deciduous; *calyx* campanulate, glabrous, teeth ovate, obtuse except the longer lanceolate lowest; *corolla* white, petals shortly clawed, especially the wide-obovate retuse standard; *stamens* 10, either in 2 bundles of 5 each or less often in one sheath split on upper side; *ovary* stipitate, pilose; style short; *ovules* 1, rarely 2. *Pod* indehiscent, rigidly coriaceous, rather long-stipitate, glabrous, reniform, 1-, very rarely 2-seeded, 1—1.5 in. long, 0.5 in. wide; *seed* reniform-falcate, 0.5 in. long, 0.3 in. wide.

INDIA: Coromandelia; S. Arcot, *Gamble*; Madras, *Heynel* Sundribuns, *Griffith* 1 *Kurz* \ *Clarke* \ *Ball* \ *Uanj* \ *Laoe* \ *Prain* Malabar; Concan, *file* *Talbot*. INDO-CHINA: Chittagong, *Roxburgh* Burma; Rangoon, *Kurz* \ Moulmein, *Wullich* PHILIPPINES: Ilo-ilo; Panay, at Igaras, *Naves* ty *Fernandez-Viliar*.

The wood-cuttera of the Sundribuns know this species as *Amanta*. According to Kurz, the powdered roots «absorb alcohol, and a spoonful of the powder in a tumblerful of water is said to be sufficient to destroy in less than half an hour the effects of alcohol even in cases bordering on *delirium tremens*." The record of this species from the Philippines requires verification; that from the Concan appears to be a mistake.

The record of this species from the Philippines requires verification; that from the Concan appears to be a mistake.

PLATE 9. *Dalbergia spinosa* *Rozb.* Flowering branch from the Sundribuns, *n. s.*; 2, twig showing hooked branch, from the Sundribuns, *n. s.*; 3, bud X 4; 4, pedicel with bracteoles X 4; 5, calyx, laid open X 4; 6, standard x 4; 7, wings x 4; 8, keel-petals X 4; 9, stamens, usual arrangement X 4; 10, stamens, occasional arrangement X 4; 11, ovary x 4; 12, ovary, laid open X 4; VI, ovule X 12; 14, fruiting branch from S. Arcot, *n. s.*; 15, pod opened, showing seed *in situ*, *n. s.*; 16, seed, *n. s.*

U 3. **DISCOLOR.**—*Pod* sformaroid; inflorescence a terminal panicle; a tree.

The position of this group is somewhat doubtful. The species » *A. H.* *J. L. L.* it was considered by Mr. Bentham, from Mitel's description *I. Macea*. The writer, after having seen the *Leitju* alliance is rather with *D. ramosa*. The position remains unsettled however, little doubt that it is, in the wide sense, there *k.* Bentham's suggestion that this species is a tree. If it be *I. T. I.* looked on as a *faVUrin* section; whereas *Podipetalum*, to which *D. Jolicez* belongs has *JTTTlu* a tree in *J. Jumi*, and *D. SUSOO* forms *Z. cultrata*.

6. DALBERGIA DISCOLOR Bl. ex Miq. Flor. Inrl. u>t • i, 130 (1855); Benth. Journ. Linn. Soc. iv. Sup/41 (1860) N v /p 1; Ho, MKp C7 (1830); P Lin. ir' A s t ; • ^ ^ Vill. Nov. App. 2, 61 (1901).

A tree? with glabrous lenticelled branches, leaves 3—7 in. long; leaflets 5—9, the distal usually largest obovate, the lateral ovate or occasionally orbicular, rounded or narrowed at apex, emarginate, glabrous above, rusty adpressed-pubescent beneath, .75—2.5 in. long, .75—1.75 in. wide, chartaceous, finely reticulate; rachis 2.5—4.5 in. long and short petiolules pubescent. Flowers minute, subsecund, in dichotomously cymose terminal panicles, 2.5—4 in. long, 1.5—2 in. wide; bracteoles subpersistent; calyx campanulate, teeth all obtuse, subequal, short; corolla not seen; stamens 9, in one sheath split along upper side; ovary not seen young. Pod coriaceous, distinctly stipitate, oblong, subacute, glabrous, veined opposite the solitary or occasionally two seeds, 1.5—2.75 in. long, .75 in. wide; seed reniform, compressed, .4 in. long, .2 in. wide, testa brown, shining.

MALAYA : Borneo; S. Coast, Korthals! Celebes; Teysmann! PHILIPPINES : Luzon, Naves & Fernandez-Villar*

This species is not very perfectly known, and only three specimens have been examined. Two of the specimens belong to the Leiden Herbarium. One of these, marked "Borneo, Korthals legit,"⁷ has been written up by Miquel "Dalbergia discolor Bl. Miq."; it is the type of (the species and from it fig. 1 of Plate 10 is taken. The other is written up "Dalbergia discolor Bl. VAR. pallens M."; it is marked simply "Borneo." Apparently Miquel never published this variety "pallens," and, as a matter of fact, it does not seem necessary to consider it varietally distinct. Its tomentum and venation are exactly as in Korthals' plant, and the different shape of the leaflets cannot be held of sufficient significance to justify its treatment as a variety. This Bornean plant without a record as to locality or collector is figured as fig. 2 of Plate 10. In Herb. Hort. Bogor. is a specimen from Celebes (Teymann 12539), which appears to me to be precisely the same as the Bornean *D. discolor*. The species is also reported from Luzon in the Philippines by the Rev. Father Naves and Fernandez-Villar, a by no means improbable distribution, which it will, however, be well for subsequent workers to verify.

From the shrivelled remains of two flowers on the smaller figured specimen, it can be seen that the stamens are monadelphous and that the calyx is almost exactly like that of *D. rimosa*, near which species it seems best to place *D. discolor*.

PLATE 10. *Dalbergia discolor* Bl.—1, Branch in fruit from Borneo, w. s.; 2, branch in fruit of the form termed *VAU. pallens* by Miquel, from Borneo, n. s.; 3, two-seeded pod, opened to show one seed *in situ*, n. s.

% \. **Eimosae**.—*Pod samaroi*; inflorescence a terminal panicle, sometimes extending into the highest leaf-axils; flowers minute; epicalycine bracteoles persistent or subpersistent; climbing.

A subgenital group. *D. rimosa* and *D. Forbesii*, though differing in pods, are very closely allied; *D. Thomsoni* stands somewhat apart, and in facies closely resembles *D. confertiflora* among the *FoUaccae*; *D. Junghuhnii*, *D. Scortchinnii*, *D. Curtisii* and *D. stercoracea* are again closely allied to each other and are rather divergent alike from *D. Thomsoni* and *D. rimosa*. The four species mentioned approach pretty closely to the *Phyllanthoides*; and indeed with regard to the members of this subgroup and their relationship to *D. phyllanthoides*, the most extraordinary confusion has prevailed both in Herbaria and in literature. For this confusion it must be frankly admitted that Bentham, Miquel, Baker and the writer have been equally blameworthy; nor would the errors we have made been committed had we attended, as we ought, more carefully to Blume's judicious sorting and to Maingay's careful field-notes. The last species included in this group *Rimosa*, *D. Mimctella* from the Philippines, is one of which the writer has seen no specimen; while it is evident, from Blanco's on the whole clear description, that the species is a *Triplolcmea*, and is either one of the *Rimosae* or one of the *Phyllanthoides*, it is not absolutely certain to which of the two groups it belongs,

7. DALBERGIA RIMOSA Roxb. Hort. Bong. 53 (1814); DC. Prodr. ii. 417 (1825); Roxb. Flor. Ind. iii. 233 (1832); Wall. Cat. 5853 (1832); Wight Ic. t. 262 (1840); Voigt Hort. Suburb. Calcutt. 241 (1845); Benth. Pl. Jungh. i. 255 (1851); Journ. Linn. Soc. iv. Suppl. 32 (1860); Brandis For. Flor. 148 (1874); Bak. in Hook. f. Flor. Brit. Ind. ii. 232 (1876); Praia Journ. As. Soc. Beng. Ixx. 2, 61 (1901).

D. foliacea Wall. Cat. 5856 B in part (1832); Gamble Darjeel. List 29 (1896), not of Roxb.

Dalbergia sp. Drake del Castillo Journ. de Bot. v. 215 (1891).

A scandent or subscandent shrub, occasionally erect and 20—25 ft. high, with many spreading branches. *Leaves* 4—8 in. long; leaflets 5—9, usually 7, ovate or obovate, elliptic, subacute or obtuse, mucronate, firmly papery, rather closely veined, bright-green, glabrous above, paler and puberulous beneath, 2—3 in. long, 1—2 in. wide; rachis 2.5—5 in. long, puberulous as are the short petiolules. *Flowers* minute, in terminal corymbose panicles of dichotomous cymes, sometimes extending into the axils of the uppermost leaves, 8—10 in. long, 5—6 in. wide; bracteoles ovate-lanceolate, persistent, epicalycine pair hardly half as long as calyx-tube; *calyx* campanulate, 5-toothed, teeth obtuse except the rather longer lowest, the two upper subconnate; *corolla* white, petals short-clawed, especially the oblong emarginate standard; *stamens* 9, or sometimes 10, in a sheath split along the upper side; filaments free in their upper third, alternately shorter and longer; *ovary* shortly stipitate, puberulous; style short; *ovules* 1—2. *Pod* indehiscent, stipitate, oblong, glabrous, thickly coriaceous veined everywhere but very strongly so opposite the 1, rarely 2 seeds, 2—3 in. long, .75—1.25 in. wide, brown; *seeds* much compressed, reniform, .5 in. long, .25 in. wide, testa brown, somewhat shining.

HIMALAYA: Sikkim; lower slopes and submontane forests of Terai and Duars, *Hooker* [King] *Gamble* [Praia] *Gammie* [Haines] INDO-CHINA: Assam; Brahmaputra Valley, *Jenlins* [Simons] *Mann* [Masters] *Peal* [Silhet, *Wallich*] *Clarke* [Cachar, *Praserl*] Khasia, *Hooker* [Sf Thomson] *Griffith* [Clarke] *Mann* [Gallatly] Naga Hills, *Clarke* [Wat] Burma; Kachin Hills, Mogaya, *Shaik Muqim* CHINA: Yunnan; Szemao, Western Mts., 5,000 ft., a large climber; South-Western Mts., 4,500 ft., a rambling shrub, 8 feet high, *Henry* 11887! 11952! TONGKING: Black river, edge of a lake near Rockers de Notre Dame, a climber, *Balansal*

In Assam, according to Peal, this is known as *Elam Salf* or *Atam Sali*; the *sali* or bark is chewed.

PLATE 11. *Dalbergia rimosa* Kozb.—1, Flowering branch, from Sikkim, *n. s.*; 2, bud X 4; 3, pedicel with bracteoles X 4; 4, calyx, laid open X 4; 5, standard X 4; 6, wings X 4; 7, keel-petals X 4; 8, stamens X 4; 9, ovary X 4; 10, ovary, opened X 4; 11, ovule X 10; 12, fruits, from Assam, *n. s.*; 13, pod opened, showing seed *in situ*, *n. s.*; 14, seed, *n. &*.

8. DALBERGIA FOEBESII Prām Journ. As. Soc. Beng. Ixx. 2, 61 (1901).

D. parviflora Prām Journ. As. Soc. Beng. lxxvi. 2, 121 partly (1897), not of Roxb.

A moderately large climbing shrub, with glabrous branches. *Leaves* 5—7 in. long; leaflets usually 5, ovate, acuminate, base rounded, the terminal slightly the largest, glabrous on both surfaces, closely finely reticulate, 1.5—3.25 in. long, .6—1.6 in. wide,

rachis 2*5—35 in. long and short petiolules glabrous. *Flowers* many, small, secund, in dichotomous cymes, disposed in terminal wide panicles extending into the axils of the upper leaves, 5—6 in. long, 3—4 in. wide; bracteoles persistent, ovate-lanceolate; *calyx* campanulate, teeth obtuse except lowest subacute, subequal, short; *corolla* white, petals rather distinctly clawed, standard orbicular subauriculate, slightly emarginate; *stamens* 9, in one sheath split along upper side, occasionally in two lateral sheaths and sometimes with a tentli free vexillary stamen present; *ovary* glabrous, shortly stipitate, style short; *ovule* solitary. *Pod* indehiscent, distinctly stipitate, coriaceous, glabrous, oblong, rounded at apex, narrowed to the base, distinctly veined opposite the seed, 1*5—2*5 in. long, *75 in. wide; *seed* reniform, compressed,

MALAYA: Sumatra; Eigni Telok, R. Rawas, 3,500 ft., *Forbesi* Lingga; *Teysmanni*

This is very nearly related to *D. parviflora*, and until an opportunity occurred of examining a fruiting specimen from Lingga was supposed to be a form of that species.

PLATE 12. *Dalbergia Forbesii* Train.—1, Branch in young fruit from Bigni Telok, R. Rawas, Sumatra, *n. s.*; 2, twig, showing leaf with break in sequence of size of leaflets, *n. s.*; 3, bud X 4; 4, pedicel with bracteoles X 4; 5, calyx, laid open X 4; 6, standard X 4; 7, wings X 4; 8, keel-petals X 4; 9, stamens X 4; 10, ovary X 4; 11, ovary, laid open X 4; 12, ovule X 10; 13 and 11, two pods, from the island of Lingga, *n. s.*

9. DALBERGIA THOMSONI Benth. Jourru Linn. Soc. *iv.* Suppl. 33 (1800); Bak. in Hook. f. Flor. Brit. Ind. ii, 236 (1876); Prain Journ. As. Soc. 13eng, Ixx. 2, 57 (1901).

A woody climber; branchlets sub-bifarious, glabrous. *Leaves* 3—4 in. long; leaflets 9—11, ovate-oblong, obtuse or retuse, base cuneate or rounded, the distal rather the largest, firmly chartaceous, closely finely reticulated, dark-green above, much paler beneath, quite glabrous on both surfaces, '75—1*25 in. long, ⁴5—*8 in. wide; rachis 1*75—2*25 in. long and petiolules '15 in. long, glabrous. *Flowers* minute, secund, in ample terminal panicles extending into the axils of the upper leaves, 8 in. long, 4 in. wide; peduncles quite glabrous, branches faintly puberulous, pedicels very short; bracteoles persistent, basal lanceolate, epicalycine pair ovate-lanceolate; *calyx* campanulate, glabrous, teeth very short, upper pair obtuse, lateral acute, lowest rather the longest, lanceolate; *corolla* greenish-white, petals all very short-clawed, standard orbicular emarginate; *stamens* 9, in one sheath or in two lateral bundles or with the obvexillary stamen also free; *ovary* minute, shortly stipitate, style rather distinct; *ovules* usually 2. *Pod* indehiscent, remaining green, rather thinly coriaceous, narrowed from below the middle to the very short tips and also upwards, the subacute apex much rounded on the lower suture, finely reticulated throughout, quite glabrous, 2'5 in. long, '85 in. wide; *seed* solitary.

INDO-CHINA: Assam; Patkoye, *Griffith**. Khasia Hills, *Hooker Sf Thomsoni Clarke I*

PLATE 13. *Dalbergia Thomsoni* Benih.—X, Flowering branch from Khasia, *n. s.*; 2, bud X 4; 3, calyx, laid open X 4; 4, standard X 4; 5, wings X 4; 6, keel-petals X 4; 7, stamens X 4; 8, ovary X 4; 9, ovary, laid open X 4; 10, ovule X 12; 11, pod, from Patkoye, *n. s.*

- 10, DALBERGIA JUNGHUHNII Benth. PL Junglx 1.254(1851); Miq. Flor. Ind. Eat. i. 1, 129 (1855); Benth. Journ. Linn. Soc. iv. Suppl. 33 partly (1860).

A woody climbing? shrub, with stoutish lenticelled branches. *Leaves* 3—4 in. long; leaflets 11—15, elliptic-oblong, obtuse, green and glabrous on both surfaces, .75 in. long, .4 in. wide; rachis puberulous, 2—3 in. long, petiolules very short, puberulous. *Flowers* minute, secund, in a condensed terminal thyrsoid panicle, 4—6 in. long, 2 in. wide; peduncles, branches and pedicels puberulous; bracteoles ovate, persistent, the basal acute, the epicalycine pair obtuse, embracing the lower third of the calyx tube; *calyx* campanulate, teeth short, the two upper obtuse, wider than the acute lateral and the shortly lanceolate longer lowest; *corolla* white, petals shortly clawed, standard orbicular-oblong, emarginate; *stamens* 9, or sometimes 10, in a sheath split along upper side, filaments free in their upper third; *ovary* glabrous, style short*, *ovules* 2—3.

MALAYA: Sumatra; at 3,000 ft. elev., *Junghuhn* Java; *do Vriesel*

The identity of this species has been confused in Herbaria and in systematic works owing to the fact that a second species, which occurs in Malacca and in Borneo, has been identified by Bentham partly with *D. polyphylla*, partly with this; and that by Baker and the writer two, if not three, other species have also been referred here. There is of course a good deal to be said for the view that all the forms in question represent only conditions of one protean species; but if this be the case, the treatment does not go quite far enough, since the Indian *D. multiflora* is another member of the same group, standing on the same footing, as regards *D. Junghuhnii*, that *D. stercoracea* Maing., *D. phyllanthoides* BL, and *D. Cur dñi* do. If this view be adopted, the name *D. multiflora* will apply to all the members of the group.

The only specimens absolutely in agreement with Junghuhn's original plant from Sumatra, here figured, are two examples—evidently of one gathering—now in the Leiden and in the Buitenzorg collections respectively. They are noted as having been obtained in Java by de Yriee.

It is probable that this species climbs, but it is not certain: the branches are much stouter than in the allied forms above enumerated, and the specimens available show no hooked branchlets. As yet fruits are unknown.

PLATE 14. *Dalbergia Junghuhnii* Benth.—1, Flowering specimen from Sumatra (*Junghuhn* 233), *n. s.*; 2, bud X 4; 3, pedicel with bracteoles X 4; 4, calyx, laid open X 4; 5, standard X 4; 6, wings X 4; 7, keel-petals X 4; 8, stamens X 4; 9, ovary X 4; 10, ovary, laid open X 4; 11, ovule X 10.

11. DALBERGIA SCORTECHINII Prain Journ. As. Soc. Beng. lxvi. 2, 444 (1897); lxx. 2, 57 (1901).

D. Junghuhnii Bak. in Hook. f. Flor. Brit. Ind. ii. 233 in part (1876), not of Benth.

↳. *Junghuhnii* VAR. *Scortechinii* Prain Journ. As. Soc. Beng. lxvi. 2, 115 (1897).

A shrubby climber, 15—30 feet long, with twining glabrous branches, here and there twisted and thickened into spiral hooks. *Leaves* 6—8 in. long; leaflets 11—15, elliptic, closely puberulous beneath, glabrous except the midrib above. .7—1.5 in., rarely in young shoots 2.5 in. long, .35—.75 in., rarely 1 in. wide; *rachis* 3—4 in. long and petiolules .15 in. long, densely puberulous. *Flowers* minute, secund, in an ample terminal and in smaller axillary panicles, 2—4 in. long, 1.5—3 in. wide; peduncles, branches and pedicels pubescent; bracts caducous; bracteoles persistent, basal very minute,

lanceolate, acuminate, epicalycine pair ovate, obtuse, embracing lower third of calyx-tube; *calyx-teeth* short obtuse except the longer lanceolate lowest; *corolla* white, petals all very short-clawed; *stamens* 9, in two lateral bundles of 5 and 4 respectively, the sheath split both on upper and lower sides, or at times in two lateral bundles of 4 each, with the ob vexillary filament free; *ovary* pubescent, shortly stipitate, style very short; *ovules* usually 3—4, rarely only 2, sometimes 5. *Pod* indehiscent, small, ovate-lanceolate, narrowed to both ends, glabrous, shortly stipitate, firmly coriaceous, 1*5—2 in. long, #5 in. wide, 1—3-seeded; *seed* reniform, compressed, *4 in. long, "25 in. wide.

MALAYA: Penang; Ayer Etam, *Curtis* ! Malacca; Bijong, *Scortecchini* ! Maingay ! Singapore; Bukit Timah, *Ridley* ! Bangka; *Teysmannl* Java; Djampong, *Teysmanil* Borneo; Sarawak, *Bcccari* ! *Ilavilandl*

Till an opportunity occurred of seeing fruits of this species, it did not seem advisable to separate it from *D. Junyuhunii* and the allied forms confused with that species.

PLATE 15. *Dalbergia Scortecbinii* Train.—1, Flowering branch from Malacca, ?? s.; 2, bud X 4; 3, pedicel with bracteoles X 4; 4, calyx, laid open X 4; 5, standard X 4; 6, wings X 4; 7, keel-petals X 4; 8, stamens X 4; 9, ovary x 4; 10, ovary, laid open X 4; 11, ovule X 8; 12, twig in fruit, from Bangka, n. s.

12. DALBEEGIA CURTISII Prain Journ. As. Soc. Beng. lxx. 2, 58 (1901).

D. discolor Miq. Flor. Ind. Bat. Suppl. 290 (1860), not of Bl,

D. Junghunii Bak. in Hook. f. Flor. Brit. Ind. ii. 233 in part (1876); Prain, Journ. As. Soc. Beng. lxxvi. 2, 115 in part (1897), not of Benth.

A scandent shrub, with closely puberulous, sub-bifarious branchlets. *Leaves* 6—7 in. long; leaflets usually 7—9, oblong or elliptic, cuneate at base, rounded, obtuse, faintly emarginate at apex, glabrous and dark-green above, pale-green and rather closely puberulous except on the midrib beneath, 1*5—2 in. long, 1 in. wide; rachis 4*5 in. long and petiolules 15 in. long, puberulous. *Flowers* minute, secund, in axillary and terminal panicles, 4—5 in. long, 3 in. wide; peduncles, branches and pedicels pubescent; bracts minute, caducous; bracteoles persistent, basal lanceolate, acuminate, minute, epicalycine pair ovate, obtuse, embracing lower third of calyx-tube; *calyx* campanulate, teeth all short, obtuse; *corolla* white, petals all short-clawed, especially the wide-oblong, emarginate standard; *stamens* 9, in one sheath split along upper side, filaments free in their upper fourth; *ovary* rather long-stipitate, closely pubescent except the stipe; style obsolete; *ovules* 2—3. *Pod*, only seen unripe, quite glabrous.

MALAYA: Sumatra; Lampongs, *Teysmannl* Malacca; Maingay \ Penang; at 500 feet elevation, *Curtis* !

This is evidently very nearly related to *D. stercoracea*, but Maingay, who has collected both, notes that this has no stercoraceous odour and is probably distinct. The leaves of this, in the specimens of all three gatherings seen by me, are larger than is usual in *D. stercoracea*; their tonientuin beneath is very different. It has besides a different calyx, different standard; and different ovary. The flowers too are quite half as large again as in *D. bUrcoracca*.

PLATE 16. *Dalbergia Curtisii* Prain.—1, Flowering branch from Penang, ?? s.; 2, bud X 4; 3, pedicel with bracteoles X 4; 4, calyx, laid open X 4; 5, standard X 4;

6, wings X 4; 7, keel-petals X 4; 8, stamens X 4; 9, ovary X 4; 10, ovary; laid open X 11, ovule X 10; 12, immature pod, from Penang, *n. s.*

13. DALBEKOIA STERCORACEA Maing. ex Prain Journ. Aa. Soc. Beng. lxx. 2, 58 (1901).
*D** *Junghuhnii* Bak. in Hook. f. Flor. Brit. Ind. ii. 233 in part (1876); Prain Journ. As. Soc. Beng. lxvi. 2. 115 YAK. *typica* in part (1897), not of Benth.
D. frondosa Miq. Flor. Ind. Bat. i. 133 VAR. *typica* only and excl. all syn. (1855), not of Roxb.

A shrubby climber, 15—30 feet long, with twining glabrous branches here and there twisted and thickened into spiral hooks. *Leaves* 3—4 in. long; leaflets 7—9, oblong or elliptic, cuneate at the base, rounded truncate or somewhat retuse at the apex, green and glabrous above, glaucescent and sparsely puberulous beneath, 6—1"25 in. long; #35—'75 in. wide, rachis 2'5—3-5 in. long, puberulous as are the petiolules *15 in. long. *Flowers* intensely stercoraceous, minute, secund, in ample terminal and in smaller axillary paniculate cymes 3—4 in. long, 2 in. wide; peduncles, branches and pedicels pubescent; bracts minute caducous; bracteoles persistent, basal lanceolate, acuminate, very minute, epicalycine pair ovate, obtuse, embracing lower third of calyx-tube; *calyx* campanulate, teeth short obtuse except the longer lowest acuto half as long as calyx-tube; *corolla* white, petals short-clawed, especially the oblong emarginate standard; *stamens* 9, in one sheath split on upper side, filaments free in their upper fourth; *ovary* shortly stipitate, pubescent towards apex; style short; *ovules* 2—3. *Pod* thin, membranous, greenish, glabrous, 25—3 in. long, 1—1'3 in. wide, 1-, rarely 2-seeded, slightly tapering to base, obtuse at apex; *seel* compressed, subreniform, *5 in. long, *3 in wide.

MALAYA: Sumatra; *Korthals* ! Malacca; *Main jay* ! *Mueller* ! *Derry* ! Singapore; *Ridley* \ *Hullei*V.

PLATE 17. *Dalbergia stercoracea* Maing.—\ Flowering branch from Malacca, *n. s.*; 2, leaf with larger leaflets, from Singapore, *n. s.*; 3, bud X 4; 4, pedicel with •bracteoles X 4; 5, calyx, laid open X 4; 6, standard X 4; 7, wings X 4; 8, keel-petals X 4; 9, stamens X 4; 10, ovary x 4; 11, ovary, laid open X 4; 12, ovule X 10; 13, fruiting branch, from Malacca, *n. s.*; 14, unrips pod, with two seeds, from Singapore, *n. s.*; 15, unripe seed, *n[^] s.*

14. DALBERGIA MIMOSELLA Prain.

D. lanceolaria Nav. & Fernand. Vill. NOT. App. Flor. Philip. 07 (1880) not of Linn.
Amerimnon Mimosella Blanco Flor. Filip. Ed. i. 563 (1837); Ed. ii. 3'J3 (1845);
 Ed. III, ii. 357 (1878).

A shrub, about 6 ft. high. *Leaves* alternate, imparipinnate; leaflets 7—more-jugate, oval or linear, obtuse. *Flowers* very small, nodding, paniced; each floret with one wide bract and 2 linear epicalycine bracteoles; *calyx* hirsute, 2-labiate, 5-partite; upper lip globed, lower 3 teeth narrower; *corolla* 4-petalled, papilionaceous, smaller than the calyx; standard short, surrounding the receptacle; wings ovate-circinate, covered by the margins of the standard which they equal in length; keel rather shorter than the wings, slit below and emarginate above; *stamens* 10, in two lateral bundles of 5 each, the sheath split above and below; filaments free in their upper part, anthers

purple, globose; *style* very short, hirsute, stigma globose. *Pod* stipitate, veined, indehiscent, round, subcultrate, very thin, projecting in the middle, the margin submembranous; *seed* usually solitary, occasionally a second rudimentary seed present, much compressed, reniform.

PHILIPPINES: Tala, *Blanco*; Luzon, at Mandeloyon, *Naves* *cf* *Fernandez-Villar*.

This plant is known to the writer only from Blanco's description, which is here reproduced. That the species belongs to the section *Triptolemca* is evident from the fact that the flowers are very small and the further fact that the style is very short. The original description unfortunately does not say whether the panicles are terminal or only axillary; it is not therefore clear whether, among the *Triptokmeae*, its place be among the *Rimosae* or among the *Phyllanthoides*. The number of leaflets, however, indicates that probably it is a member of the former group rather than of the latter, for none of the members of the *Phyllanthoides* group have so few leaflets as 7. The erect habit, for Blanco describes it as a shrub as tall as a man, is unusual in the section, but too much stress should not be laid on this character, since other members of both groups may climb or be erect according to circumstances. The character of isodiadelphous stamens, on which the identification suggested by Naves and Fernandez Villars obviously depends, is not a reliable one; though characteristic, on the whole, of the section *Dalbergaria* to which *D. lanceolaria* belongs, it is not unknown in *Triptolemca* where *D. Scortchinii*, *D. phyllanthoides* var. *typica*, and *D. melanoxydon* casually if not constantly exhibit it. The other characters are quite antagonistic to the identification of the species with *D. lanceolaria*. It is of course not improbable that the editors of the third edition of Blanco had access to specimens of *D. frondosa* Miq. and had supposed that Miquel's plants so named, which are both obviously nearly related to Blanco's one, were really *I. frondosa* Roxb. The account that Blanco gives of the pod seems to show that the species forms a link between the *Nummularieae* and the rest of the *Triptolemeae*. Blanco gives the vernacular name as *Macapil*.

*[5. **Phyllanthoides**.—*Pod* samaroid; inflorescence of axillary panicles rarely extending to the ends of the branches; flowers small; epicalyptic bracteoles deciduous; climbers.

This is apparently a quite natural group, and to the writer undoubtedly a group that should be referred to *Triptolemea*. It is, however, only right to point out that Bentham regarded two of the species of the group as *Sissoae*, not *Triptokmeae*; *I. multiflora* is his *D. sympathetic* and *D. melanoxydon* includes his *D. Stocksii*. The specific treatment accorded by Bentham to the forms of this group is, however, rather confusing, for *D. melanoxydon* he refers to § *Dalbergaria*, while *D. Stocksii*, which is the same plant, he refers to § *Sissoa*. *D. phyllanthoides*, when collected in Malacca, he has placed in *D. Junghuhnii*; when collected in Borneo he has referred it to *D. polyphylla*. *D. coromandeliana* he has, and in this he follows Wight and Arnott, placed in *Selenolobium* as a portion of *I. spinosa*, which it does not really greatly resemble. The most doubtful of the four as to sectional position is *D. melanoxydon*, which has a rather longer standard-claw and a rather longer stylo than are proper for a *Triptolemea*, so that it might almost equally well be relegated to *Podiopedalum*.

15. DALBEGIA MULTIFLOEA Heyne ex Wall, in Cat. sub. n. 5848 (1832); Praia Journ. As. Soc. Ueng. lxx. 2, 59 (1901).

D. sympathetic Nimmo in Grab. Cat. Bomb. PL 55 (1839); Voigt Hort. Suburb. Calcutt. 241 (1845); Benth. PL Jungh. i, 255 (1851); Journ. Linn. Soc. iv. Suppl. 42 (1860); Dalz. & Gibs. Bomb. Flor. 78 (1861); Bak. in Hook. f. Flor. Brit. Ind. ii. 234 (1876); Talbot Bomb. List, 75 (1894); Woodr. Journ. Nat. Hist. Soc. Bomb. xi. 426 (1897); Cooke Flor. Pres. Bomb. i. 398 (1902).

D. frondosa Wall. Cat. 5855 partly (1832), not of Roxb.

D. paniculata Wall. Cat. 5848 partly (1832), not of Roxb.

D. ferruginea Hohenack. ex Bak. in Hook. f. Flor. Brit. Ind. ii, 234 (1876), not of Roxb.

Amorhnnuni Jwrridum Dennst. Schl. Hort, Malub, 31 (1818).

Ana-mullu JJhecede Hort. Malabar, viii. t. 40 (1088).

A large climber, with sometimes thickened hooked branches, or casually erect and straggling; stems beset with strong spines; young branches sub-bifarious, pubescent. *Leaves* 2-5—3-5 in. long; leaflets 11—15, elliptic-oblong, apex obtuse, truncate or emarginate, base wide-cuneate or rounded, pale-green, pubescent above, densely pubescent beneath, but ultimately becoming glabrous above and occasionally only sparsely adpressed-pubescent beneath, '25—'4 in. long, *2—[#]3 in. wide; rachis 2—3 in. long, densely pubescent as are the short petiolules. *Flowers* minute, secund, in small axillary panicles, 1*5—2 in. long, *75—1 in. wide; peduncles, branches and pedicels pubescent; bracteoles persistent, basal ovate-acute, epicalycino ovate-obtusum embracing lower third of calyx-tube; *calyx* campanulate, pubescent; teeth short, obtuse except the lowest longest; *corolla* white, claws of petals short, standard obovate, emarginate; *stamens* 9, in one sheath split along upper side; *ovary* densely pubescent, stipitate; *ovules* 2—4. *Pod* thin, bright-green, membranous, usually 1-seeded, occasionally 2—3-, rarely 4-seeded, 1*5—4 in. long, [#]75—1 in. (occasionally 1*25 in.) wide, persistently velvety-pubescent, slightly reticulated opposite the seeds; *seed* reniform, compressed, *4 in. long, *25 in. wide.

VAff *typica*: leaflets persistently pubescent beneath, rarely quite glabrous above.

INDIA: Malabar; Concan, *Stocks I Kuntzz* \ Canara, *IlohenacJcer ! Talbot* Mysore, *Ileynel Wight*] Travancore, *Rheede* (Ic.)! *Law&onl*

VAR. *glabrescem*: leaflets glabrescent to glabrous beneath, quite glabrous above.

I>DU: Malabar; Travancore, *Lawsonl Bourdillonl* Coromandelia; Carnatic, *G. Thomson ! Wight !*

This species is very nearly related to *D. phyllanthoides* from Malaya, and only differs in having a velvety-pubescent pod, that of *Z. phyllanthoicks* being quite glabrous. The two forms here separated as varieties hardly deserve varietal rank. Of Indian, as opposed to Malayan, species the nearest to this one is *I. coromandéuana*, which might be looked on as an extreme form were it not that its pods are quite glabrous.

PLATE 18. *Dalbergia multiflora* *IJeym.—l*, Flowering branch from Travancoro, *n. s.*; 2, bud X 4; 3, calyx, laid open X 4; 4, standard X 4; 5, wings X 4; 6, keel-petals X 4; 7, stamens X 4; 8, ovary X 4; 9, ovary, laid open X 4; 10, ovule X 10; 11, flowering twig, from Canara, *n. s.*; 12, single pod of the broad type, *n. s.*; 13, seed, *v. s.*

16. DALBERGIA PHYLLANTHOIDES Bl. ex Miq. Flor. Ind. Bat. i. 1, 134 (1855); Praia Journ. As. Soc. Beng. lxx. 2, 60 (1901).

B. senoides 131. ex Miq. Flor. Ind. Bat. i. 1, 134 (1855).

D. frondosa VAR. /9. Miq. Flor. Ind. Bat. i. 1, 134 (1855), not of Roxb.

D. Jimghuhnii Benth. Journ. Linn. Soc. iv. Suppl. 33 partly (1860); Bak. in Hook. f. Flor. Brit. Ind. ii. 233 partly (1876), not of Benth. PI. Jungh.

D. polyphylla Benth. Journ. Linn. Soc. iv. Suppl. 34 partly (1860), not of PI. Jungh.

D. subsympalhetica Prain Journ. As. Soc. Bong. lxvi. 2, 116 (1897).

D. Uttoralis Hassk. MSS. in Hort. Bogor.; Schimp. ex Sclenk in Sclimp. Bot. Mittheilung. aus den Tropen iv. 1, 211 (1892); Taub. in Engl. Naturlich. Pflanzenfam. Hi. 3, 336 (1891); Prain Journ. As. Soc. Beng. lxx. 2, 60 (1901).

A climbing shrub, '60—80 feet long, or casually a spreading shrub or small tree, 15—30 feet high, branches often thickened into curved or spiral hooks; branchlets puberulous or pubescent, surrounded at their point of origin by a cluster of scaly bracts. *Leaves* 1'D—3 in. long; leaflets 9—15, elliptic-oblong, rounded truncate or slightly retuse, base wide-cuneate or rounded, green and glabrous above, paler and pubescent with long adpressed hairs beneath, '25—*4 in. long, *2—3 in. wide; rachis 1—2*5 in. long, densely pubescent as are the short petiolules. *Floicers* minute, secund, in small axillary panicles on the young branches, 1.5—2 in. . long, -75 — 1 in. wide; peduncles, branches and pedicels densely pubescent; bracteoles persistent, basal lanceolate, epicalycine pair ovate, embracing lower fourth of calyx-tube; *calyx* campanulate, teeth short, obtuse except the longer acute or lanceolate lowest; *corolh* white, petals all short-clawed, standard oblong to wide-obovate, emarginate; *stamens* 9, in one sheath split along upper side or at times in two lateral sheaths; *ovary* glabrous or slightly puberulous along one or rarely both sutures, shortly stipitate; style short; *ovules* 3. *Pod* indehiscent, thin, membranous, greenish, quite glabrous, 2.5 in. long, 1 in. wide, 1-seeded, very rarely 2-seeded, obtuse at apex, abruptly cuneate at base and shortly stipitate; *seed* reniform, compressed, not seen ripe.

VAR. *typica*; leaflets almost membranous. *D. phyllanthoides* Bl. loc. cit.

MALAYA: Java; *Blumel NageV.* Borneo; *Barter I Motley I*

VAR. *sennoides*; leaflets firmer, usually larger. *D. sennoides* Bl, loc. cit.; *D. sulsymphathetica* Prain loc. cit.

MALAYA: Peninsula; Perak, *Scoriechinil Wrayl Kmntlerl* Penang, *Curtfel* Malacca, *Griffith ! Goodenogh ! Jag or ! Maingay !* Java ; cult.

This specie?, one of the group to which belong *D. Junghuhnii*, *D. stercoracea*, *D. Curtini* and *D. Scortechinii* is allied, mo't nearly of them nil, to *D. multiflora*, the leading Indian member of the same group. It differs, however, very markedly in its glabrous instead of velvety pod; nor is it reported to have the spiny stem that characterises *D. multiflora*. From *D. Junghuhnii* it differs in the shape and texture of its leaflets and in the inflorescence not being a terminal leafless panicle. From *D. stercoracea*, so generally confused with *D. Junghuhnii*, it differs in having more numerous and differently-shaped leaflets and in apparently not having the stercoraceous odour. It is much less like *D. Curtisii* and *D. Scortechinii*, although, as will be seen from the synonymy, Miquel was inclined to treat this as a variety of *D. Curtisii*.

PLATE 10. *Dalbergia phyllanthoides* BL—1, Flowering branch, from Borneo, to. s. ; 2 bud X 4 ; * 3J pedicel with epicalycine bracteoles X 4 ; 4, calyx, laid open x 4 ; b\ standard X 4 ; 6, wings X 4 ; 7, keel-petals X 4 ; 8, stamens X 4 ; 9, ovary x 4 ; 10, ovary, laid open X 4 ; 11, ovule X 12.

PLATE 20. *Dalbergia phyllanthoides* Bl. VAR. *sennoides* Prain.—1, Flowering branch, from Perak, n. s. ; 2, bud X 4 ; 3, pedicel with bracteoles X 4 ; 4, calyx, laid open X 4 ; 5, standard X 4 ; 6, wings X 4 ; 7, keel-petals x 4 ; 8, stamens X 4 ; 9, ovary X 4 ; 10, ovary, laid open X 4 ; 11, ovule X 10 ; 12, fruiting branch, from Perak, U.S. ; 13, unripe seed, n. s.

17. DALBERGIA COSOUANLELIANA Praia Journ. As. Soc. Beng, Ixx. 2, CO (1901).
D. spinosa W. & A. Prodr. i. 266 (1834), not of Roxb.

An erect glabrous shrub, the ultimate branches bifarious, horizontal, rigid, spinous, leaves fasciculate on small tubercles, #75—1*5 in. long; leaflets 7—9, rarely 11, elliptic or cuneate-oblong, obtuse or retuse, #25—%35 in. long, '12—*2 in. wide, glabrous on both surfaces, pale-green; rachis '5—1*2 in. long, at first puberulous, but soon glabrous; petiolules very short, glabrous. Flowers minute, secund, in small recurved cymose panicles, fascicled on small tubercles, 7 in. long, #5 in. wide, peduncles puberulous, pedicels glabrous; bracteoles caducous, basal lanceolate, epicalycine orate, subacute, embracing lower third of calyx-tube; calyx campanulate, teeth obtuse except lowest subacute, one-third as long as tube; corolla white, petals rather distinctly clawed; stamens 9, in one sheath split along upper side or in two lateral bundles or occasionally in two bundles with the obvexillary stamen also free; ovary glabrescent, distinctly stipitate, style short; cvules 2—4. Pod indehiscent, thinly coriaceous, ovate subacute, distinctly wide-reticulate throughout, base cuneate, rather long-stipitate, quite glabrous, 1'75 in. long, *6 in. wide; seed large, rsniform, compressed, *5 in. long, '3 in. wide, brown, hardly shining.

INDIA: Coromandelia; Shovagiri Hills, Wight\

This plant, which appears to be rare, for it has been only twice or thrice collected, and in each case by Wight, must be looked on as one of the doubtful species in this work. That it is not *D. ?pinosa* Eoxb. an examination of the figure of that species will at once demonstrate. Wight and Arnott, following Wallich, were themselves uncertain as to the identity of the two, and the unqualified acceptance by subsequent writers of Wight's *D. spinosa* as identical with Roxburgh's, was not based on fuller knowledge. The affinity is with *D. multiflora*, and is so close that this may prove to be no more than an outlying form of that species, which, though it has no spines on the smaller branches, has a spinous main-stem. The size of the leaflets, much smaller in *D. coromandeliana* than in *D. multiflora*, is not a sufficiently differential feature, nor perhaps is the fact that the leaves are fascicled in the present plant, but not in *D. multiflora*. The pods differ in shape and size, but this again, having regard to the great variability within *D. multiflora*, is not an absolute character. The absence of all tomentum from the pods of *D. coromandeliana* must, however, be esteemed, at least for the present, as diagnostic, if for no other reason than because of its convenience. If, in spite of this difference, *D. coromandeliana* be reduced to *D. multiflora*, then *D. phyllanthoides*, which differs even less essentially than *D. coromandelia* does, must also be so reduced; while if *D. multiflora*, *D. phyllanthoides* and *D. coromandeliana* are treated as conspecific, it may be necessary to treat some of the other Malayan forms with which *D. phyllanthoides* has been so much confused as integral portions of the same protean plant.

PLATE 21. *Dalbergia coromandeliana* Train.—1, Flowering branch, Wight 798 (K. D. 821), *n. s.*; 2, bud X 4; 3, calyx, laid open X 4; 4, standard X 4; 5, wings X 4; 6, keel-petals X 4; 7, ovary X 4; 8, ovary, laid open X 4; 9, ovule X 10; 10, fruiting branch, from Shevagiri Hills, Wight (K. D. 822), *n. s.*; 11, seed *n. s.*

18. DALBERGIA MELANOTYZON Guill. & Perr. Flor. Seneg. Tent. 227, t. 33 1834 ;
 Benth. Journ. Linn. Soc. iv. Suppl. 47, (1860); Dalz. & Gibs. Bomb. Flor.
 Suppl. 24 (1861); Prain Journ. As. Soc. Eeng. lxxvi. 2, 446 (1897); Ixx. 2,
 59 (1901); Cooke, Flor. Pres. Bomb. i. 396 (1902).

D. Stocfoii Benth. Journ. Linn. Soc. iv. Suppl. 42 (1860); Bak. in Hook. f.
 Flor. Brit. Ind. ii. 234 (1876); Talbot Bomb. List 75 (1894); Woodr.
 Journ. Bomb. Nat. Hist. Soc. xi. 426 (1897).

A shrub or a small tree with many wide-spreading drooping branches, or a climber; branches with occasional sharp spines; branchlets sub-bifarious, puberulous; bark white, sapwood yellow, heart-wood quite black, very hard. *Leaves* 4—8 in. long; leaflets 9—17, obovate or ovate-oblong, obtuse or retuse, sparsely adpressed-pubescent on both surfaces but especially beneath, ultimately nearly glabrous, finely reticulately veined, '75 in. long, '45 in. wide, in young shoots occasionally 1*5 in. long, 1 in. wide; rachis 3'5—7 in. long, and very short petiolules glabrous or faintly puberulous, *Floivcrs* small, subsecund, in terminal and axillary panicles, appearing rather before the leaves, 1*5—3 in. long, 1'5—2 in. wide; peduncles, branches and pedicels puberulous; bracteoles subsistent, basal lanceolate, the epicalycine pair small, ovate, puberulous, embracing base of calyx-tube; *calyx* campanulate, teeth very short, obtuse except the lanceolate lowest equalling the tube; *corolla* white, petals short-clawed, standard oblong, slightly emarginate; *stamens* 9, in one sheath split along upper side or in two lateral bundles or occasionally in two bundles with the obvexillary stamen also free; *ovary* glabrous, distinctly stipitate; style short; *ovules* 1—2. rarely 3. *Pod* indehiscent, ovate or shortly oblong glabrous, distinctly stipitate, uniformly wide-reticulate, 1-seeded, occasionally 2-seeded, rarely 3-seeded, 1—2*75 in. long, '6 in. wide; *sczd* reniforiri, much compressed, *5 in. long, *3 in. wide.

INDIA: Malabarria; Canara, *Talbotl* Concan, *Stocksl* Cullivated at Poona! Madras, Calcutta!—DISTRIB. Africa, from Senegal (*Lclievrel Hciidclotl*) to Ethiopia (*KotsctfyX*), Abyssinia (*Schimperl Plowdt.nl*) and Mozambique (*Petersl*).

It is necessary to remark that, so far as it goes, the description given of *D. ohlongifolia* G. Don [*Gen. Syst. Gard.* ii. 375 (1832)] is quite applicable to this species. If the two prove to be the same, the name *D. mdanoxylon* must give place to Don's. Mr. E. G\ Baker, who has kindly looked into this matter, however, informs the writer that there is no authentic example of *D. oblong if0ILI* Don, in the British Museum collection, where many of Don's types are preserved.

In India this is spoken of as "China Blackwood;" in Africa it is termed "Senaar Ebony/'

PLATE 22. *Dalbergia melanoxylon* *Guill. & Perr.*—1, Young flowering twig, from tho Concan, *n. s.*; 2, flowering specimen from a planted shrub, Poona, *n. s.*; 3, bud X 4', 4? calyx, laid open X 4; 5, pedicel with bracteoles X 4; 6, standard X 4; 7, wings X 4; 8, keel-petals X 4; 9, stamen³ X 4; 10, ovary X 4; 11, ovary, laid open X 4; 12, ovule X 10; 13, fruiting twig from a planted shrub, Calcutta, *n. s.*; 14* pod, laid open, showing seed *in situ*, *n. s.*; 15, seed, *n. s.*

f[6, MimOSOides.—*Pod samaroid; inflorescence axillary; flowers small; epicalycine bractcoles' deciduous; iving-petals subhastate; "climbers.*

That the three species in this group constitute a natural aggregation of forms is undoubted; the question indeed rather is whether they may *not* all be varieties of one specie³. Since, however, t seems on the whole better to hold with Franchet that two of the furens are distinct, it becomes necessary to separate the remaining form, which differs almost equally from the other *two*. Although ifl ^{o'h^r} respects *Triptokneae*, and indeed *B. Milldtii* has been by Bentham himself referred* to that section, these three forms by the single character of wing-petals *wore closely approach* the *Amerimma* than do any of the other *Bissoae*. Among the *Pcdiopdala* their nearest ally 19 l> *Hancr*, which but for its longer standard-claw might almost be placed *in* this group.

19. DALBERGIA MILLETTII Benth. Journ. Linn. Soc. *iv.* Suppl 34 (1860); Flor. Hongkong, 92 (1862); Forbes & HemsL Journ. Linn. Soc. xxiii. 198 (1887); Praia Journ. As. Soc. Beng. lxx. 2, 57 (1901).

D. pohjphjlla Benth. PL Jungh. i. 256 partly (1851); Seem, Bot. Her. 375 (1855); not of Benth. in Journ. Linn. Soc. iv. Suppl.

Derris pinnata Lour. Flor. Cochinchin. 432 (1790) possibly.

A climber, with glabrous lenticled branches, sometimes hooked; young branchlets glabrous or only very sparsely puberulous, surrounded at point of origin by scaly bracts. *Leaves* 1.5—2 in. long; leaflets 25—35, small, linear or narrowly oblong, obtuse or retuse, quite glabrous on both surfaces, close-set, 4 in. long; #2 in. wide; rachis 1.25—1.5 in. long, finely puberulous, petiolules glabrous; stipules ovate, deciduous. *Flowers* small, secund, in condensed axillary panicles, 5 in. long, #4 in. wide, along the young branchlets; peduncles, branches, and pedicels very sparsely pubescent; bractcoles glabrous, ovate, basal persistent, the epicalycine pair embracing lower third of calyx-tube, deciduous; *calyx* campanulate, nearly glabrous; teeth short, subequal, obtuse except the acute lowest, the two upper subconnate; *corolla* white, petals short-clawed, standard orbicular, emarginate; *stamens* 9, in one sheath split along upper side; *ovary* stipitate sparsely pilose; style short; *ovules* 2—3. *Pod* indehiscent, firmly coriaceous, reticulated, and somewhat indurated opposite the solitary, rarely 2 seeds, glabrous, ovate-obtuse, base rounded, stipitate, 2*25 in. long, .75 in. wide; *seed* reniform, compressed, 5 in. long, .25 in. wide.

CHIXA: Kwangtung; Hongkong, *Ilanca*! *Wilford*! *Ford*! *Champion*!

Except for its very short almost glabrous panicles, in which character it resembles *D. Uancei*, and for its quite glabrous leaves, there seems to be nothing to separate this species from *D. mimosoides* Franch., the pods of the two being practically identical. The leaflets vary a little in width just as do those of *D. mimosoides*, but they are smaller and narrower in *D. Millettii* than they usually are in *D. mimosoides*.*

In a previous discussion of the species of *Dalbergia*, the writer attempted to identify with the Hongkong plant some Hupeli and Yunnan specimens. A closer study of these, and the supply of fuller material of the Hongkong plant kindly communicated by Mr. Ford, show that this treatment is not justified except in the wider sense in which *D. Millettii* is held to include both *D. mimosoides* and *D. deuphujua*. Their longer panicles show that neither the Ilu-pek nor the Yunnan plant agrees with *D. Millettii*; the former is *D. stemphylloides*, the latter is *D. mimosoides*.

The fact that *D. Millettii* has glabrous leaflets renders it possible that in this species we have the plant described by Loureiro as *Derris pinnata* (Flor. Cochinchin. 432); the absence of any definite account of the root, however, leaves the point uncertain. Moreover, the species has not so far been collected outside Hongkong: even in the writer's view that would accept both *D. Htenophylla*, and *D. mimosoides* as forms of *D. Millettii*, the species has not been collected in Cochinchina.

The most satisfactory treatment for the moment is to transcribe Loureiro's description of *Derris pinnata* and retain that Cochinchina plant as a species of *Dalbergia* of doubtful identity, in the hope that our colleagues, the French botanists in Eastern Indo-China, may take the matter up and settle the identity of Loureiro's species. The rhomboid base to the leaflets is the character that supports its identification with *D. tamarindifolia*; if, however, the leaflets be really glabrous that suggestion is hardly tenable.

DALBERGIA TINXATA sp. dub.

Derris pinnata Lour. Flor. Cochinchin. 432 (1790).

A climbing shrub, with long, unarmed, much-branched stem. *Leaves* pinnate; leaflets numerous, alternate, ovate-oblong with base rhomboid, small, glabrous, entire. *Flowers* on many-flowered lateral peduncles; *corolla* white. *Pod* 1-seeded.

COCHIN-CHINA: in forests.

The fleshy reddish root is used instead of, and for the same purposes as, the betel-nut (*Areca*), which is much chewed by the indigenous inhabitants along with the aromatic pan-leaf (*Piper Benth.*).

PLATE 23. *Dalbergia Millettii Benth.*—1, Flowering branch, from Hongkong, *n. s.*; 2, twig showing spiral hook, from Hongkong, *n. s.*; 3, bud X 4; 4, pedicel with epicalycine bracteoles X 4; 5, calyx, laid open X 4; 6, standard X 4; 7, wing x 4; 8, keel-petals X 4; 9, stamens X 4; 10, ovary X 4; 11, ovary, laid open x 4; 12, ovule X 10; 13, twig in fruit, from Hongkong, *n. s.*; 14, twig with fruit of broader type, from same gathering as 13, *n. s.*; 15, pod opened, showing seed *in situ*, *n. s.*; 16, seed, *n. s.*

20. DALBERGIA STENOPHYLLA Prain Journ. As. Soc. Beng. lxx. 2, 56 (1901).

D. Millettii Harms in Engl. Bot. Jahrb. xxix. 415 (1900), hardly of Benth.

A climber, with lenticelled branches; branchlets sparsely puberulous or glabrous, surrounded at point of origin by scaly bracts. *Leaves* 2*5—4 in. long; leaflets 31—41, small, narrowly linear-oblong, obtuse, at first sparsely pubescent on both surfaces, soon glabrous except on midrib beneath, close-set, '5 in. long, *15 in. wide; rachis 2—3'5 in. long, finely adpressed-puberulous or glabrous, petiolules short, glabrous; stipules ovate, deciduous. *Flowers* small, secund, in axillary panicles along young branches, 2—2*5 in. long, 1*5 in. wide; peduncles, branches, and pedicels puberulous; bracteoles puberulous, basal persistent, the epicalycine pair embracing the lower third of calyx-tube, deciduous; *calyx* campanulate, finely puberulous; teeth short, the upper pair obtuse, subconnate, the lateral acute, the lowest longer, shortly lanceolate; *corolla* white, petals short-clawed, standard wide-ovate, obtuse; *stamens* 9, in one sheath split along upper side; *ovary* stipitate, sparsely pilose along sutures; style short; *ovules* 3. *Pod* indehiscent, thinly but firmly coriaceous, very faintly reticulated opposite the one or two seeds, glabrous, ligulate, subacute, base narrowed to the distinct stipe, 1*25—2 in. long, '3 in. wide; *seed* reniform, compressed, *35 in, long, #2 in. wide.

CHINA: Hupeh; *Henry* \ Szechuen; Kyminese, near Tchan-Keou, *Farges*

This species is very nearly related to *D. Millettii* and to *D. mimosoides*, agreeing with latter in its elongated panicles, but more approaching the former in its comparative absence of pubescence. The leaflets however, though as long as those of *D. mimosoides*, are as narrow as or narrower than those of *D. Millettii*, while the fruit is different from that of either of these species.

Kang-kin-ten is given by *Farges* as the Chinese name for the species.

PLATE 24. *Dalbergia stenophylla Prain.*—1, Flowering specimen, from Hupeh, *n. s.*; 2, bud X 4; 3, calyx, laid open X 4; 4, standard X 4; 5, wings x 4; 6, keel-petals X 4; 7, stamens X 4; 8, ovary X 4; 9, ovary, laid open x 4; 10, ovule X 12; 11, fruiting branch, from Hupeh, *n. s.*; 12, fruit, opened, showing seed *in situ*, *n. s.*; 13, seed, *n. s.*

21. DALBERGIA MIMOSOIDES Franch. PI. Delavay. 187 (1890); Prain Journ. As. Soc. Beng. lxx. 2, 56 (1901).

D. tamandifolia Koxb. Flor. Ind. iii. 233 partly (1832); Wight Ic. t. 242 (1840) as to the fruit.

D. Jilleitii Prain Journ. As. Soc. Beng. Ixvi. 2, 446 (1897), hardly of Benth-

A climber, with glabrous lenticelled branches; young branchlets densely rusty-pubescent, surrounded at point of origin by scaly bracts. *Leaves* 2-5-4 in. long; leaflets

25—35, small, linear-oblong, obtuse or retuse, at first pubescent at length glabrous above, finely but sparsely adpressed-puberulous beneath, close-set, .5 in. long, .25 in. wide; rachis 2—3.5 in. long and very short petiolules at first densely pubescent, at length only puberulous; stipules membranous, ovate, deciduous. *Flowers* small, secund, in axillary panicles along the young branchlets; peduncles, branches and pedicels pubescent; bracteoles pubescent, ovate, basal persistent, the epicalycine pair embracing lower third of calyx-tube, deciduous; *calyx* campanulate, nearly glabrous; teeth short, obtuse except the rather longer lowest; *corolla* white, petals short-clawed, standard oblong-obovate, emarginate; *stamens* 9, or occasionally 10, in one sheath split along upper side; *ovary* stipitate, sparsely pilose along the sutures or glabrous, style short; *ovules* 3. *Pod* indehiscent, thickly coriaceous, somewhat indurated and reticulated opposite the solitary, rarely 2, seeds, glabrous, ovate-acute, base rounded, stipitate, 1.5—2.5 in. long, .75 in. wide; *seed* reniform, compressed, .4 in. long, .25 in. wide.

INDO-CRINA: Assam; Khasia Hills, *Mann\ Cullett\ Gallally\ Clarke* \ CHINA: Yunnan; Tapintze, *Delavay\ Mengtze, Henry* \ Szechuen; Tatchienlu, *Pratt*! E. HIMALAYA: Sikkim; Tista Valley, below Choong-thang, 5,000 ft., *Prainl*

PLATE 25. *Dalbergia mimosoides* Franch.— 1, Flowering branch, from Khasia Hills, *n. s.*; 2, bud X 4; 3, calyx, laid open X 4; 4, standard X 4; 5, wings X 4; 6, keel-petals X 4; 7, stamens X 4; 8, ovary x 4; 9, ovary, laid open X 4; 10, ovule X 10; 11, fruiting branch, from Khasia Hills, *n. s.*; 12, pod, laid open, showing seed *in situ, n.s.*; 13, seed, *n. s.*

§2. FODIOPETALUM.—Flowers small or medium; epicalycine bracteoles always deciduous; inflorescence not distinctly cymose; claws of all petals rather long, that of standard about as long as the rest; style usually stout, cylindrical, rarely (*JD. Sissoo*) short.

^7. **FoliaCGaO.**—*Pod* samaroid, oblong or ovate; leaflets obtuse; wings not hastate; stylo stout, cylindrical; epicalycine bracteoles obtuse shorter than calyx; climbers.

This group, though perhaps only subnatural, nevertheless exhibits a fairly regular transition, among species that are clearly *Podiopetala* and that are all of scandent habit, from the small-leaved 2). *Ilincei* to the large-leaved 7X *foliacea*. Perhaps it might be more convenient to treat the group as comprising two subgroups, distinguished by the axillary and the terminal inflorescences. *D. confertiflora* among those with a terminal inflorescence is very distinct from the remaining species in foliage and in fruit; *D. foliacea* is also very distinct; *D. yunnanensis* and *D. Collettii*, on the other hand, are in essentials remarkably alike, the chief difference being that the flowers of *D. Collettii* are considerably smaller than those of *D. yunnanensis*'s. But for its rather longer standard-claw and rather longer style than is usual in that section, and especially but for its remarkably close affinity to *D. yunnanensis*, one might with almost equal propriety refer *D. Collettii* to *Triploemca*.

22. DALBERGIA HANCEI Benth. Journ. Linn. Soc. iv. Suppl. 33 (1860); Flor. Hong-kong 93 (1861); Forbes & Hemsl. Journ. Linn. Soc. xxiii. 198 (1887); Praia Journ. As. Soc. Bong. lxx. 2, 57 (1901).

A woody climber, branches at times slightly hooked. *Leaves* 2—2.5 in. long; leaflets 9—11, narrow-oblong, obtuse truncate or retuse, base cuneate or rounded, dark-green and at first sparsely adpressed-pubescent but soon glabrous above, pale-green and persistently adpressed-pubescent beneath, .6—1.75 in. long, .25—35 in. wide; rachis 1.5—1.75 in. long, and petioles .15 in. long, quite glabrous; stipules membranous, lanceolate,

•3 in. long, very caducous, puberulous. *Flown* small, secund, in dense axillary panicles, •5—75 in. long, -3—5 in. wide; peduncles and pedicels densely pubescent, bracts scaly, clustered, enclosing the young inflorescence, soon deciduous; bracteoles deciduous, the basal minute lanceolate, the epicalycine pair ovate, obtuse, enclosing base of calyx-tube, pubescent; *calyx* campanulate; teeth very short obtuse, pubescent externally; *corolla* greenish-white, petals all rather long-clawed, standard orbicular, emarginate, subreflexed, auriculate at base of blade; *stamens* 9, in a sheath split along upper side, inserted with petals one-third up calyx-tube, sometimes with a free vexillary stamen; *ovary* short-stipitate, pubescent; style rather long, stigma minute; *ovules* 3—4. *Pod* indehiscent, ovate lanceolate to ligulate, firmly coriaceous, glabrous, distinctly stipitate, 1—4 seeded, not very distinctly reticulated opposite the seeds, 1*5—3 in. long, #4—#5 in. wide; *seed* reniform, compressed, #3 in. long, *2 in. wide.

CHINA: Kwang-tung; Hongkong, *Hance!* *Wilford!* *Weiss!* *Ford!* Macao, *Callery!* Canton, *Park!*

Park notes this as 'brought iu wild from near Canton, a shrubby plant, rambling, *Eobinia* in appearance.'

PLATE 26. *Dalbergia Hancei Benih.*—1, Flowering specimen, from Hongkong, *n. s.*; 2, bud X 4; 3, pedicel, with epicalycine bracteoles X 4; 4, calyx, laid open x 4; 5, standard X 4; 6, wings X 4; 7, keel-petals X 4; 8, stamens X 4; 9, ovary x 4; 10, ovary, laid open X 4; 11, ovule X 10; 12, fruiting branch, from Hongkong, *n. s.*; 13, pod, laid open, showing seed *in situ*, *n. s.*; 14, seed, *n. s.*

23, DALBERGIA DYERIANA Prain ex Harms in Engl. 13ot. Jahrb, xxix. 416 (1900); Journ. As. Soc. Beng. lxx. 2, 44 (1901).

A large climber, with rather slender, blackish, glabrous, spreading, sub-bifarious branches, sometimes hooked. *Leaves* 3—5 in. long; leaflets 11—15, obovate-oblong, base cuneate, apex rounded retuse, thinly coriaceous, finely closely reticulate, sparsely adpressed-pubescent beneath, 1—1'2 in. long, -3—'5 in. wide; rachis 2*5—3 5 in. long, and petiolules '1 in. long, glabrous or sparsely pubescent. *Flowers* in lax rather few-flowered axillary panicles, 2 in. long, 1-25 in. wide, peduncles and pedicels, the latter •1 in. long, puberulous; *calyx* puberulous, campanulate, with oblong to lanceolate basal bracteoles; teeth triangular obtuse, the two upper the widest, the lowest longer than the others, subacute; *corolla* yellowish-white, petals distinctly clawed, standard oblong, emarginate; *stamens* 9, connate in a sheath split on upper side, filaments free in their upper fourth, alternately shorter and longer; *ovary* stipitate, glabrous or puberulous; stipe always puberulous; style always glabrous, stigma small, capitate; *ovules* 2—3. *Pod* indehiscent, thinly coriaceous, distinctly stipitate, linear-oblong, 1—2-seeded, 2-5—3-5 in. long, -5 in. wide, finely but distinctly reticulated opposite the seeds; *seed* oblong-reniform, -5 in. long, -2 in. wide, -15 in. thick.

CHINA: Hupeh, *Henry* 3437! 4132! 4138! 45611 Szechuen; near Ky-min-se, *Farges* 107G! Yunnan; Mengtze, *Henry* 10503!

Farges give8 the Chinese name in Szechuen as *Ta-kang-Kn-ien*.

PLATE 27. *Dalbergia Dyeriana Prain*— 1, Flowering shoot from Mengtze, Yunnan, *n. s.*; 2, young calyx, with epicalycine bracteoles X 4; 3, calyx, laid open x 4;

4, epicalycine bracteoles X 4; 5, standard X 4; 6, wings X 4; 7, keel-petals x 4; 8, stamens x 4; 9, ovary, x 4; 10, ovary, laid open X 4; 11, ovule X 10; 12, fruiting branch, from Hupeh, *n. a.*; 13, pod, *n. s.*; 14, seed, *n. &*.

24. DALBERGIA CONFERTIFLORA Benth. PI. Jungh. i. 255 (1851); Journ. Linn. Soc. iv. Suppl. 41 (1860); Bak. in Hook. f. Flor. Brit. Ind. ii. 233 (1876); Praia Journ. As. Soc. Beng. l_{xv}i. 2, 114 (1897); lxx. 2, 56 (1901); Bengal Plants i. 411 (1903).

D. paniculata Wall. Cat. 5848 partly (1832), not of Roxb.

D. nihigimsa Kurz Journ. As. Soc. Beng. xlv. 2, 281 (1876); For. Flor. Burm. i. 317 (1877), not of Roxb.

D. Thwmsoni Kurz For. Flor. Burm. i. 549 (1877), not of Benth.

A large climber, with lenticelled branches; branchlets sparsely puberulous, soon glabrescent. *Leaves* 4—6 in. long; leaflets 11—15, oblong, obtuse or retuse, base subcuneate, green and glabrous above, paler and sparsely puberulous beneath, firmly chartaceous, 1-1-5 in. long, -5--75 in. wide, the terminal rather the largest; rachis 3—4 in. long and petiolules glabrous. *Flowers* small, in ample terminal panicles extending into the axils of the uppermost leaves, 3-5 in. long, the panicle branches ending in corymbosely or subcapitately crowded cymes; peduncles, branches and pedicels rather densely rusty-pubescent; bracteoles ovate, densely pubescent, the basal deciduous, the epicalycine pair embracing lower fifth of calyx-tube; *calyx* narrowly campanulas, rusty-pubescent; teeth short obtuse except the lowest longer acute; *corolla* white, petals rather short-clawed, standard orbicular-oblong, emarginate; *stamens* 9, in one sheath split along upper side; *ovary* stipitate, pubescent along the sutures, elsewhere glabrous; style short; *ovules* 3—4. *Pod* indehiscent, thinly coriaceous, narrowly oblong, quite glabrous, apex Bubacite, base rounded, shortly stipitate, faintly veined opposite the 1-2, rarely 3 seeds, 2—3 in. long; 75—1 in. wide; *seed* reniform, compressed, -35 in. long, -25 in. wide.

HIMALAYA: Daphla Hills; *Lister* \ INDO-CHINA; Assam; Khasia Hills, *Simons*] Silhet, *Gomes & de Silva* Chittagong; Kasalong, *Lister*] *Clarke*] Thandacheri, *Badal Khan* I Burma; Pegu, *Kurz*] Andamans; S.Andaman, *Man*] *IMnigX*

PLATE 28. *Dalbergia confertiflora* Benth.—\, Flowering branch, from Chittagong, *n. s.*; 2, bud x 4; 3, pedicel and bracteoles X 4; 4, calyx, laid open X 4; 5, standard X 4; 6, wings X 4; 7, keel-petals X 4; 8, stamens X 4; 9, ovary X 4; 10, ovary, opened X 4; 11, ovule X 12; 12, twig, in fruit, from the Andamans, *n. s.*; 13, pod, opened, showing seed *in situ*, *n.s.*; 14, seed, *n. s.*

25. DALBERGIA YUXNANENSIS Franch. PI. Delavay. 187 (1890); Prahm Journ. As. Soc. Beng. lxx. 2, 43 (1901).

A large climber, or a large shrub or small tree with eubsarmentose trunk with numerous spreading branches, some of which are casually hooked. *Leaves* 8—12 in. long; leaflets usually 15, occasionally 13, often 17—19, rarely more, elliptic with rounded base and obtuse, occasionally emarginate apex, finely pubescent with adpressed hairs on both surfaces, more densely on the midrib beneath, the distal not exceeding the others, the lowest rather smaller than the rest, 1—2 in., rarely 3 in. long, -5—8 in.,

rarely 1—1*25 in, wide, rather dull-green above, paler beneath; rachis 6—9 in. long, puberulous; petiolules *2 in. long, pubescent; stipules caducous. *Flowers* shortly pedicelled, in cymose terminal panicles extending into axils of upper leaves, with puberulous peduncle and branches, 6 in. long, 3 in. wide; *calyx* campanulate, sparsely pubescent externally, with 2 ovate, deciduous, membranous basal bracts, 5-toothed; teeth with ciliate margins, obtuse, the two upper subconnate, the lowest considerably longer than the lateral and as long as the tube; *corolla* white; petals all distinctly clawed, standard with oblong emarginate limb; *stamens* 9, connate in a sheath split along upper side, filaments free in their upper third, alternately shorter and longer; *ovary* glabrous or slightly puberulous along one suture and on the rather long stipe, style short, stigma small, capitate; *ovules* 2—3. *Pod* glabrous, indehiscent, distinctly stipitate, ovate or ovate-lanceolate, acute or obtuse, distinctly reticulated and somewhat thickened opposite the solitary seed, 2—2*5 in. long, #8—1 in. wide; *seed* much compressed, orbicular-reniform, 5 in. long, #3 in. wide, *15 in. thick; testa brown, smooth, not shining,

S. CHINA: Yunnan; near Tapintze and at Yen-tzehay, *Delavay* 510! 654! 2050! Meng-tze, *Henry* 10205! Szemao Mts., 5000 ft., *Henry* 11898!

Very nearly related to *D. foliaeea*, of which it exhibits the habit, but with larger flowers, more numerous and smaller leaflets, and smaller pods.

PLATE 29. *Dalbergia yunnanensis* *Franch.*—1, Flowering branch from Yunnan, collected by *Delavay*, w. s.; 2, portion of branch with hooked branchlet, n. s.; 3, bracteoles X 4; 4, calyx, laid open X 4; 5, standard X 4; 6, wings X 4; 7, keel-petals X 4; 8, stamens X 4; 9, ovaries, one entire, one laid open X 4; 10, ovule, much enlarged; 11, fruiting spray, from a Yunnan specimen, n. s.; 12, fruit, laid open, showing seed *in situ*, n. s.; 13, seed, n. s.

26. DALBERGIA COLLETTII *Prain* Journ. As. Soc. Beng. Ixvi. 2, 445 (1897) in part, as to sp. *Collett.* only; Ixx. 2, 445 (1901).

Dalbergia sp. *Coll & Hemsl.* Journ. Linn. Soc. xxviii. 50 (1891).

A scandent shrub. *Leaves* 6 in. long; leaflets 13—15, narrowly elliptic, obtuse or subacute, membranous, dark-green, sparsely grey-pubescent above, rather densely pubescent, especially on the midrib beneath, 1'25 in. long, -45 in. wide; rachis 4'25 in. lono* grey-pubescent as are the pedicels, *15 in. long; stipules caducous, membranous. *Flowers* in dense corymbose terminal panicles extending into the axils of the uppermost leaves, 4 in. long, 2 in. wide, peduncles and branches grey-pubescent; bracts ovate, bracteoles 2, large, ovate, membranous, caducous, embracing the lower half of the calyx-tube, grey-pubescent; *calyx* campanulate, #1 in. long, upper teeth subconnate and lateral obtuse shorter than tube, lowest lanceolate nearly as long as tube; *corolla* white, -2 long, petals short-clawed, standard oblong, slightly emarginate, not reflexed; *stamens* 9, in one sheath split along upper side; filaments free in their upper third, alternately shorter and longer; *ovary* very shortly stipitate, glabrous except on stipe and along lower suture, style short stout; *ovules* 2. *Fruit* not seen.

BURMA: Shan Hills; at Kawlo, 5,000 ft., *Collett* 591! Ywagin, 4,000 ft., *Collett* 723!

The Lwekaw specimens associated with this by the writer in 1897 do not belong here, but are the same as *Dalbergia Hemsleyi*, which is a considerable tree, whereas this is noted by *Collett* on his

n. 591 a9 a scandent shrub. The pubescence in *D. IJemdeyi* is very like that in the present species, but the leaflets are fewer and larger and have a very different venation. The nearest ally of *D. Collettii* is not *D. velutina*, as suggested by Collett and Hemsley, *he. cit.*; it differs by its smaller flowers in terminal panicles, by its differently-shaped and deciduous stipules, by its larger epicalycine bracteoles; also by the absence of auricles from the bases of the wing-blades. Its nearest ally is *D. yunnanensis* Franch., from which it mainly differs in the smaller size of its flowers and leaflets, and of which it may prove to be only a variety.

PLATE: 30. *Dalbergia Collettii* *Praia*.—1, Flowering branch, from the Shan Hills, *n. s.*; 2, bud X 4; 3, pedicel and epicalycine bracteoles X 4; 4, calyx, laid open X 4; 5, standard X 4; 6, wings X 4; 7, keel-petals X 4; 8, stamens X 4; 9, ovary X 4; 10, ovary, laid open X 4; 11, ovule X 8.

27. DALBERGIA FOUACEA Wall. Cat. 5830 (1832); Benth. PI. Jungh. i. 255 (1851); Journ. Linn. Soc. iv. Suppl. 41 (1860); Bak. in Hook. f. Flor. Brit. Ind. ii. 232 (1870); Kurz Journ. As. Soc. Beng. xlv. 2, 230 (1876); For. Flor. Burm. t. 247 (1877); Prain Journ. As. Soc. Beng. lxx. 2, 43 (1901).
D. entadoides Pierre MSS. in Herb. Pierre.

A large climber, with numerous spreading branches, some of which are casually hooked; occasionally erect, 20—25 feet high. *Leaves* 7—9 in. long; leaflets usually 7, occasionally 9—11, elliptic-oblong, obtuse or retuse, glabrous above, glabrous or finely puberulous beneath, the distal rather the largest, 1/5—4 in. long, 1/5—2 in. wide, duller blight-green; rachis 4 in. long, petiolules 1/2 in. long; stipules caducous. *Flowers* almost sessile, in wide cymose terminal panicles with puberulous branchlets, 4—9 in. long, 2—5 in. wide; *calyx* campanulate, glabrous or puberulous, with two ovate deciduous basal bracts, 5-toothed, teeth obtuse, the two upper subconnate, the lowest slightly longer than lateral and about as long as the tube; *corolla* white, petals all rather long-clawed; standard with oblong emarginate limb; *stamens* 10, less often 9, connate in a sheath split along upper side; filaments free in their upper third, alternately shorter and longer; *ovary* glabrous or slightly puberulous along one suture and on the other long stipe; style short; stigma small capitate; *ovules* 2—3. *Pod* indehiscent, distinctly stipitate, subacute, reddish-brown, firmly coriaceous, glabrous, 1—2-seeded; very markedly reticulated opposite the seed, 3—4 in. long, 1—1/25 in. wide; *seed* much compressed, reniform, 1/5 in. long, 1/25 in. wide, 1/15 in. thick; testa brown, smooth, hardly shining.

INDO-CHINA: Teiasserim; Amherst, *Walliehl* Panlong Creek, *Wallichl* Moulmein, *Wallichl* Kalian river, *Wallichl* Mergui, *Heifer* 180M Pegu; Rangoon, *Cleghornl* Pegu, *Kurz* 2602! Tharawadi, *Mansonl* Shan Plateau; Fort Stedman, *Abdul Iliuq* Prazerl Moné, *Abdul Khalill* Siam; borders of the Great Lake, *Godefroy* 680! Cambodia; Pén Lovier, in the plains, *Pierre* 509!

Mr. Bentham and, following him, Mr. Baker state that this is a tree: Mr. Kurz, however, has noted that it is a climber, and specimens both from Burma and Siam have the branches not infrequently hooked. This is the case even with some examples which are noted by Prazer as being from a tree 20—25 feet high, which shows that, as is the case with a number of other species of *Dalbergia*, this is a climber when it has anything to rest on but can develop an erect habit and climb upon itself when no foreign support is available.

The specimens from Siam and Cambodia (*Godefroy* 68G and *Pierre* 509) agree absolutely; they differ from the majority of the Burmese specimens in having the leaflets beneath quite glabrous, their

fruit is as yet unknown; should it differ from that of *D. oliacea*, they may have to be considered a distinct species and will then be known by the MSS. name *D. tintidoide** which M. Pierre has proposed.

Wallich's n. 5356, on which the species is based, is much and differently mixed in various herbaria with *D. stijmlacea*, *D. torta*, *D. volulilis*, and *D. rimom*.

PLATE 31. *Dalbergia foliacea* Wall—1. Flowering branch, from the Slum Platenu w. s.; 2, calyx with "bracteoles X 4; 3, calyx, laid open X 4; 4, standard X 4; 5, wings X 4; 6, keel-petals X 4; 7, stamens X 4; 8, ovary X 4; 9, tlo same, laid open X 4; 10, ovule X 10; 11, fruiting branch, from Pegu, n. s.; 12, seed, n. s.

«18. **Cultratae**— *Pod samaroid, oblong ; leaflets obtuse ; wings not hastate; style stout cijUadric; cpical/cinG bracteolcs sub date, shorter than calyx ; trees.*

The species of this group are clearly *Sistoe* of tlio section *Podio/wtahm*, but stand well apart from all other groups in the genus except the *Rodratae*, which are clearly *Amcrlmna* of the section. *EnJespermi'm*, by the subulate epicalycine bracteoles. The triviality of the character adds to its value: in this case it is associated with a structure of the anthers that is not met with in any other Asiatic *Dalbergia*.

28. DALBERGU CULTRATA Grah. in Wall. Cat. 5861 (1832); Benth. PI. Jungh, i. 254(1851); Journ. Linn. Soc. iv. Suppl. 39 (1860); Bak. in Hook. f. Flor. Brit. Ind. ii. 233 (1876); Kurz Journ. As. Soc. Beng. xlv. 2, 280; For. Flor. Burm. i. 342 (1877); Coll. & Hemsl. Journ. Linn. Soc. xxviii. 50 (1891) ; Prafn Journ. As. Soc. Beng. lxx. 2, 45 (1901).

Z. *zeylanica* Wall. Cat. 5847 B. (1832), not of Ptoxb.

A fine tree, 30—70 fset high, with glabrous lenticellod branches, branchiets sub-bifarious; trunk 2-5—3 feet thick, bark rather smooth, pale. *Laves* 6—8 in. long; kaflets usually 7, occasionally 9, rarely 11, elliptic-obovate, when young subicuto and covered beneath with fine deciduous hairs, when full grown quite glabrous on bolli ficcs and obtuse almost always retusc at apex, finely reticulately veined, *t)w* distal SUJ : , d_{1e} hl-o-estj 3—1-75 in. long, *6—1*5 in. wide; rachis 5-6 in. long, glabrous, ra₁h₁ Tiles -1S^ⁿ/long; stipules minute, pubescent, very caducous. *Flowers* in short We₁al B-abfasciculate panicles 2 in. long; peduncles and slender pedicels, -15 in. t₁ n t₁ fi]6t be,et with scattered rusty hairs, soon glabrous; bracts lanceolate, TadtouT bracteoles at base of pedicels and two, occasionally only one, at base of •lvx subulate soon deciduous; *calyx* campanulate, -15 in. long, at first with scattered d₁ iduous hairs', soon glabrous, teeth subequal, ovate-acute, the two upper subconnato; eCl// mle_rose' with a yellow spot at base of standard, or white; petals all distinctly 7° d₁ *<andard orbicular, emarginate; *stamens* 9, monadolphous, in a sheath split along clawe , -d₁*' fihments free in their anterior third, subequal, anthers with subapical slits upper Si₁les q₁ ^ to leaye tho antber> after poH₁cn is sh₁cd, as a gaping 2-lippad cup ; T₁ , nuiteelabrous, stipitate; style stout; stigma capitate; *ovules* almost always 3. *Fed* r' q₁ " -a usllly 1 « W , 2 in. long, r>rely S-S-Bcodcd, 3-4 in. long. -6 £.,, widc, col'accous, Pi₁ 1 f₁ intfy 1-0ticulatL4 opposite the sceJ; s:ei compressed, reaiforui, pale straw-coiourtu, K₁^ J brown, -tin Ion₁ -25 in. wide.

Indo-P₁ A: Burma- Pe-a, Kurz 1787! 2609! WalUchl McClelland\ Brawlis I Shan Hills 'YevTcoUcl 4061'Taungyi, Kififs Collector ! near Maymyo, Pr^er I Teiassorim;

Paratola, 2,500 ft., Taepo, 5,000 ft., and Chuku Plains, *Oallatly!* Troglia, near the hills, *Wallich* 5847B! Tavoy, *Shaik Muqitiml* Siam; Radboerie, *Teysmann* 6027!

Kurz gives the Burmese name as *Yendiki*.

PLATE 32. *Dalbergia cultrata* Grah.—1, Branch in flower and young leaf, from Pegu, *n. s.*; 2, pedicel with basal and epicalycine bracteoles x 4; 3, bud x 4; 4, calyx, laid open X 6; 5, standard X 6; 6, wings X 6; 7, keel-petals X 6; 8, stamens X 6; 9, ovary X 6; 10, ovary, laid open X 6; 11, ovule X 10; 12, fruiting branch, from Tenasserim, *n. s.*; 13, pod, one valve removed, showing seed *in situ*, *n. s.*; 14, seed, *n. s.*

29. DALBERGIA FUSCA Pierre MSS. in Herb. Pierre.

A tree; wood red. *Leaves* 4—6 in. long; leaflets 7—10, ovate, obtuse or retuse, base cuneate, dark-green glabrous above, finely adpressed-pubescent beneath, 75—1*5 in. long, 5—#75 in. wide; rachis 3*25—45 in. long, sparsely pubescent as are the petiolules #2 in. long; stipules caducous. *Flowers* in short axillary and infra-axillary panicles, 15 in. long, #5 in. wide; pedicels #2 in. long, slender; bracts and bracteoles not seen; *calyx* campanulate, 3 lower teeth wide-triangular, acute, the lowest one-half longer than the lateral, 2 upper rounded subconnate; *corolla* white, petals rather long-clawed, standard not seen; *stamens* in one sheath split above; anthers not seen. *Pod* stipitate, ligulate-lanceolate, firmly coriaceous, narrowed to both ends but more abruptly to the apex, 2*5—4 in. long, *6 in. wide, 1-, rarely 2-seeded; *seed* reniform, compressed, #4 in. long, •25 in. wide.

INDO-CHINA: Cochin China; Bienhoa, near Baochung, *Pierre's collectors!* at Baochianh, *Pierre* 1706! Burma; Pinmona, *King's collector 1* CHINA: Yunnan, Szemao Mts., 5,000 ft., *Henry* 11,667!

This is very near, perhaps too near, *D. cultrata* Grah; the calyx hardly differs, the wings and keel-petals are identical; the leaflets, however, are always distinctly smaller than in *B. cultrata* and differ markedly from those of that species in being persistently adpressed-pubescent beneath and in having a less prominent midrib. The Anamite name is *Cdm-lai*. In Yunnan it is a small to medium tree.

PLATE 33. *Dalbergia fusca* Pierre.—1, Branch, with leaves and fruit, from Baochianh, *n. s.*; 2, calyx, laid open X 4; 3, wing-petal X 4; 4, keel-petal X 4; 5, strninal sheath, anthers fallen X 4; 6, pod, laid open, showing young seed *in sittr*, *n. s.*

^["9. SisSOO.—*Pod samaroidj narrow-ligulate; leaflets acuminate; neither tvings nor Iceel-petals hastate; style very short, stoat; epicalycine bracteoles obluse, as long as calyx; a tree.*

This group, which contains but one species, is also a very distinct one. The characters of the main-group *Sissoa* are in the solitary member, *D. Sissoo*, shown in their most emphatic form since neither the wings nor the keel-petals are hastate and the standard, though quite large, is not thrown backward as in the *Amerimna*. But while the long standard-claw marks it ns a typical *PodcòpetrJum* it shares with the *Triptolmeae* the short style, while it at the same time shares with the group *Lati-foUae*—which in all other respects are very different and are quite typical members of the section *JUiscolobium* among the *Amerimna*—the character of possessing very large caducous epicalycine bracteoles that, till they fall, quite envelope the calyx.

30. DALBERGIA SISSOO Roxb. Hort. Beng. 53 (1814); DO. Prodr. ii. 416 (1825); Roxb. Fior. Ind. iii. 223(18:32); Wall. Cat. 5850 (1832); W. & A. Prodr. i. 264 (1834); Grab. Cat. Bomb. Pl. 55 (1839); Voigt Hoit. Suburb. Calcutt. 241 (1845); Benth. Pl. Jungh. i. 254(1851); Journ. Linn. Sue. iv. Suppl. 40 (1860); Dalz. & Gibs. Bomb. Flor. Suppl. 24 (1861); Bedd. Flor. Sylvat. t. 25 (1869); Stewart Panjab Pl. 65 (1869); Brand. For. Flor. 149 (1874); Bak. in Hook. f. Flor. Brit. Ind. ii. 231 (1876); Talbot Bomb. List 74 (1894); Gamble Darjeel. List 28 (1896); Woodr. Journ. Nat. Hist. Soc. Bomb. xi. 426 (1897); Prain Journ. As. Soc. Beng. lxx. 2, 40 (1901); Kanjilal Flor. Sch. Circ. 128 (1901); Cooke Flor. Pres. Bomb. i. 395 (1902); Prain Bengal Plants i. 411 (1903).

D. penduh Ten. Rend. Soc. Borb. Nap. i. 409 (1842).

A tree, 30—80 ft. high, with rough grey bark and usually a crooked stem that maybe 4 ft. in diam. at 5 ft. from the ground, with numerous spreading branches; young shoots pendulous, sub-bifarious, pubescent. *Leaves* 6 in. long; leaflets usually 5, but often 3, occasionally 4, suborbicular, cuspidate, very rarely obtuse, occasionally, on young shoots after pollarding, ovate-lanceolate; pale-green, puberulous when young, smooth and shining when old, though sometimes more persistently puberulous in the drier western parts of its habitat; distal leaflets almost always the largest, 1—2*5 in. long and broad or in the adventitious narrower form, 1—2*5 in. long by 1—1 in. broad; rachis 2'5—3*5 in. long, somewhat zigzag; petiolules 2 in. long, at first puberulous, ultimately glabrous; stipules lanceolate, caducous. *Flowers* almost sessile, in short axillary subcymose puberulous panicles, 2'5 in. long; *calyx* campanulate, enclosed within 2 large, very caducous, membranous bracts, puberulous, 5-toothed, the two upper teeth rounded, the lateral pair subacute, shorter than the rather narrow acute lowest, all shorter than the tube; *corolla* yellowish-white, petals all rather long-clawed, standard with suborbicular, slightly emarginate limb; *stamens* 9, in one sheath split along upper side, filaments free in their upper fourth, alternately shorter and longer; *ovary* pubescent, rather long-stipitate, style very short, stigma capitate; *ovules* 4—0. *Pod* indehiscent, shortly stipitate, obtuse, strap-shaped, pale straw-coloured or ultimately brownish, firmly coriaceous, glabrous, 1—2 or rarely 3-seeded, distinctly but sparingly veined opposite the seeds, 2'5—3 in. long, #5 in. wide; *seed* much compressed, reniform, *3 in. long, #2 in. wide, '07 in. thick, testa brown, hardly shining.

N.-W. FRONTIER: Beluchistan; *Stocks* 718! *Lace* 3497! 361.5! N.-W. HIMALAYA: Hazara, *Stewart* 32! Yunasar, *Schlich*! Below Komharsen, *Gamble* 6151! Chamba, *Clarke* 23723! Kangra, *Clarke* 23810! Dehra Dun, *King* 1 RAJPUTANA: Ajinir, *Moir*! Makerji Hill, *Brandis* 1 PANJAB: Campbellpur, occasional on river cliffs, *Stewart* 71! SIKKIM: Terai, *Gamble* \ Duars, *Prain* 1 Lower Hills, *Hooker* \ ASSAM: Brahmaputra Valley, '*Simons* \ *Mann* 36!

Cultivated examples—PANJAB: Lahore, *Brandis*! Delhi, *O. Euntzel* Meerut, *Thomson*! *Clarkel* CHITTAGONG: Sitapahar reserve, *Ellis*! UPPER GANGETIC PLAIN: Oudo, *Wallich* \ Saharanpur, *Royle* \ Etawali, *Hume* 1 LOWER GANGETIC PLAIN: Bengal, *Wallich* \ *Kurz* \ *Prain* 1 DECCAN: Poona, *Tilak* \ *Cooke* 1 Gwalior, *Maries* \ Saugor, *Jerdon* 1 S.INDIA: Coorg, *Hohenacker* 1 Paulghat, *Wight*! *Naidool* Madras, *Ecynel*

It is not certain, though it is probable, that the species is nowhere truly wild save in the submontane forests, and then only in gravelly river beds, along the Himalaya from Upper Assam to

the Panjab. It is given by Hooker as occurring up to 1,000 feet in Sikkim, and it occurs up to 3,000 — 4,000 feet in the North-West Himalaya and in Beluchistan. The only suggestion of its being possibly wild in S. India is a note by Hohenacker on a sheet in the Herb. De Oandolle, where it is mentioned as occurring in the forests of Coorg, where the inhabitants know it as *Bihti Mara*.

Mr. Bentham states that the ovules may be 2—4, but the writer has never met with fewer than 4 ovules and 5—6 are quite common numbers. Roxburgh says the pod is 3-seeded, by which he must mean that pods occur which are 3-seeded, but not pods with more than 3 seeds.* Bentham also admits the existence of 3-seeded pods, but states that there may be only one seed. The writer has never met with a pod containing more than 2 seeds, and the proportion of 1-seeded to 2-seeded pods is in reality as 85: 15. The leaves of this species in Eajputana and in Beluchistan remain long, sometimes apparently persistently, pubescent: those of the submontane forests and of trees planted in Eastern and Southern India early become glabrous.

The form of leaf with narrow leaflets is only known in cultivated trees, and has only been met with in the Panjab and in the Upper Gangetic plain; it appears to be strictly confined to the adventitious shoots that appear after pollarding. The terminal flower of a raceme often has three in place of the normal two basal bracts.

This species is often spoken of as nearly allied to *D. latifolia*. That both are *Dalbergias* and both are familiar timber-trees is true: beyond those fundamental characters there is, however, no obvious affinity between the two. The petals are very different, for in *D. Sissoo* neither the wings nor the keel-petals are auriculate, in *D. Ulifolia* both are; in *D. SISSJO* the style is very short and stout; in *D. latifolia* it is long and slender. In *D. Sissoo* the pod is narrow-ligulate, quite unlike that of *D. latifolia* and its allies, and most like that met with in the two otherwise very different species—*D. sericea* and 2). *sacerdatum*.

Buohanan-Hamilton (*Martin's Eiatory*), writing of this species, says it is not indigenous in Purnea, away from the foothills, though it is extensively planted. He points out that it is a very different tree from the *Sisu* of South India, which is also a *Dalbergia*, and observes that the name *Sisu* in Purnea is likewise given to *Stillingia sebifera*.

PLATE 34. *Dalbergia Sissoo Roxb.*—1, Branch showing both flower and fruit (the latter a year old), from a tree cultivated in Bengal, *n. s.*; 2, leaf, full grown, from a Merwara specimen, *n. s.*; 3, leaf, young, of the narrow-leafed form, from the Panjab, *n. s.*; 4, calyx, laid open X 4; 5, standard X 4; 6, wings X 4; 7, keel-petals X 4; 8, staminal sheath X 4; 9, ovaries, one entire, one laid open X 4; 10, ovule, greatly enlarged; 11, seed, *n. s.*; 12, bud, showing enveloping bracteoles X 6.

* Mr. Baker describes the pod of *D. Sissoo* as having sometimes 4 seeds and a_3 not being veined opposite the seed: possibly this description applies to the fruit of some other species.

SUBGENUS 11.-AMERIMNON.



Flowers with the standard-blade reflexed or refracted; wings and keel-petals both hastate; style long, slender, usually subulate, rarely cylindrical.

This is a very natural subgenus, the characters to be obtained from the petals being more uniform throughout its limits than they are in *Sissoa*. The reason for this is perhaps partly that there is much less variation in size of flowers here than in *Sissoa*. In character of pod there is much the same variety; all the types that prevail in *Sissoa* recur in *Amerimnon*, though the nummular type is in this subgenus absent from Asia.

§ 3# ENDESPERMUM.—Standard rather distinctly refracted at junction of rather small blade and narrow claw; stamens normally monadelphous; style subulate.

This section is, as regards the majority of its species, very distinct. A few, however, but for their monadelphous stamens, are very like climbing *Dalbergarias*, and a few, but for their refracted vexillum, are much like the *Vrfutinae* among the *Miacolobia*.

^| 10. Rostratae.—Pods wide-ligulate, samaroid; epicalycine bracteoles subulate; leaflets large, few; climbers or small trees.

The epicalycine bracteoles, which are like those of the % *Cultrafae*, mark this group as very distinct not only from the rest of the *Endesperma* but from all the other Asiatic *Amerimna*,

3L DALBERGIA HULLETTII Prain Journ. As. Soc. Beng. Ixvi. 2, 119 (1897); lxx, 2, 45 (1901).

A small tree with blackish, rugose, rusty-puberulous, thickish branchlets, leafless when in flower; stipules ovate-acute, *25 in. long, rusty-pubescent. Flowers in short clustered racemes, 1—1*5 in. long, rising among tufts of triangular rusty-pubescent, small bracts in axils of fallen leaves; lowest pedicels longest, slender, -3 in. long, rusty-pubescent as are the peduncles; bracteoles at base of pedicels ovate-lanceolate, long persistent, -1 in. long; bracteoles below calyx small, subulate, deciduous; calyx campanulate, densely rusty-tomentose, ^σ in. long; teeth acute, half as long as tube; corolla white, petals long-clawed, standard orbicular, reflexed; stamens 9, rarely 10, in one sheath split along upper side; ovary glabrous, with long, densely pubescent stipe; ovule solitary.

MALAYA: Singapore, in swampy scrub jungle; *Bullett* 626!

This species is evidently very nearly related to the Bornean *D. Havilandi*, but differs in having a glabrous ovary, larger main-bracteoles and smaller stipules; leaves have not yet been seen. Mr. R. W. Hullett, who collected this plant in 1885, and who was asked in 1896 whether he had ever seen it again, has written (27th September 1896):—

"It was in a bit of Bwampy land covered with scrub, about five miles from Singapore. But now most of the scrub has been cleared away and I could find no signs. It was on 21st February 1885 that I collected it, and I shall look out about the same time next year and am not hopeless of success."

But unfortunately the search has been far been hopeless.

PLATE 35 A. *Dalbergia Hullettii* Prain.—1, Portion of flowering branch, *n. s.*; 2, young flower X 4; 3, pedicel with bracteoles X 4; 4, calyx, laid open X 4; 5, standard X 4; 6, 6', wings X 4; 7, keel-petals X 4; 8, stamens X 4; 9, ovary X 4; 10, ovary, laid open X 4; 11, ovule X 4.

32. DALBERGU HAVILANDI Prain Journ. As. Soc. Beng. lxx. 2, 45 (1901).

A small tree, with blackish, rugose, rusty-puberulous, thickish branchlets. *Leaves* 3—4 in. long; leaflets I—3; when 3 the lateral ones subopposite, ovate obtuse or subacute, base truncate; pubescent, especially on the nerves above, densely velvety beneath, firmly coriaceous, 2—3 in. long, I—1*5 in. wide; rachis #5—1 in. long, densely velvety; petiolules velvety, #15 in. long; stipules ovate, acute, '3 in. long, densely velvety. *Flowers* in short clustered racemes, *5—I in. long, rising among tufts of triangular rusty-velvety bracts in axils of fallen leaves, lowest pedicels longest, slender, #3 in. long, tawny-pubescent as are the peduncles; bracteoles at base of pedicels ovate-lanceolate, persistent, #05 in. long; bracteoles below calyx small, subulate, deciduous; *calyx* campanulate, tawny - tomentose, #15 in. long; teeth acute, half as long as tube; *corolla* white, petals long-clawed, standard orbicular, reflexed; *stamens* 9, in one sheath split along upper side or occasionally (*fide* Haviland *in filed-note*), also along lower side with then two bundles of 5 and 4 respectively; *ovary* densely pubescent with long pubescent stipe; *ovules* 2.

MALAYA: Borneo, near Kuching, *Haviland* 2894! 2895!

PLATE 35 B. *Dalbergia Havilandi* Prain.—12, Leafy twig, ?i. \$.; 13, flowering twig, *n. s.*; 14, young flower X 4; 15, pedicel with bracteoles X 4; 16, calyx, laid open X 4; 17, stamens x 4; 18, wings x 4; 19, keel-petals X 4; 20, ovary X 4; 21, ovary, laid open x 4; 22, ovule X 10.

33, DALBERGIA ROSTRATA Grali. in Wall. Cat. 5867 (1832); Prain Journ, As. Soc. Beng. lxx. 2, 45 (1901).

D. Sissoo Miq. Fior. Ind. Bat. i. 123 (1855), not of Roxb.

D. pseudo-sissoo Miq. Flor. Ind. Bat. i. 128 (1855); Prain Journ. As, Soc. Beng. lxxvi. 2, 113 (18.97).

D. diversifolia Bl. ex Miq. Flor. Ind. Bat, i. 1, 128 (1855).

D. Championii Thw. Enum. Pl. Zeylan. 9t (1359); Benth. Journ. Linn. Soc. iv. Suppl. 39 (1860); Bak. in Hook. f. Flor. Brit. Ind. ii. 231 (1876); Trim. Ceyl. Flor. ii. 83 (1894).

D. nitida Zipp. ex Prain Journ. As. Soc. Beng. lxx, 2, 46 (1901).

Endespermum diversifolium Bl. ex Miq. Flor, Ind. Bat. i. 5, 128 (1855).

E. ucylicium Champ, ex Thw. Enum. PL Zeylan. 94 (1859).

A shrubby climber, 15—25 feet long, with twining glabrous branches; occasionally erect, 15—20 feet high. *Leaves* glabrous, medium-green, 6 in. long; leaflets firm, usually 3—4, occasionally 5; rarely 2 or even solitary, oblong, slightly narrowed from beyond the middle to the cuneate or rounded base, widely rounded and abruptly cuspidate at apex, 2—4 in. long, 1—2 in. wide, the terminal usually distinctly the largest; rachis 2—3 in. long, petiolules 25 in. long, both glabrous; stipules caducous. *Flowers* in lax axillary panicles with subcorymbose branches, 2*5—3*5 in. long and nearly as wide; the peduncles and branches finely grey-downy; pedicels *15 in. long, with small

caducous ovate basal bracteoles and slender subulate bracteoles under the calyx; *calyx* campanulate, 2 in. long, puberulous externally, teeth subequal in length, wide-triangular except the narrow lowest, the two upper subconnate; *corolla* creamy-white, the petal-tips flushed with pink; petals all long-clawed, standard irregularly orbicular-oblong, limb reflexed; *stamens* usually 9, in one sheath split along upper side, filaments free in their upper third, alternately shorter and longer, anthers ultimately gaping, cup-like; *ovary* long-stipitate, densely pubescent, usually 1-, but frequently 2-ovuled, style slender incurved, stigma minute. *Pod* indehiscent, brownish, ligulate, obtuse, firmly coriaceous, 3—4 in. long, 5—65 in. wide; *seed* solitary, oblong 75 in. long, 25 in. wide, testa reddish-brown, smooth, shining.

MALAYA: Celebes; at Lepo-Lepo near Kandari, *Beccari!* Borneo; Kuching, *Haviland* 2111! Sungei Upanang, *Beccari* 3379! Gunong Woh, *Beccari* 2845! Igau, *Beccari* 3906! 3908! Singkawang, *Teysmann* 7875! Java; *Blame* \ *Zippell* \ *Ilasskarll* Malay Peninsula; Perak, *Eunstler!* \ *Scortechini* \ *Wray!* Penang, *Curtis!* Singapore, *Wallich* 5867! *Hidleill* \ *Ridley* \ CEYLON: moist regions from 2,000—4,000 feet, *Champion!* \ *Thivaites!* INDIA: Tinivelly; Tambraparni river, at foot of ghâts, *BedJomt* 2424 !

PLATE 36. *Dalbergia rostrata* *Grah.*—1, Flowering branch, from Perak, *n. s.*; 2, bud X 4; 3, pedicel with epicalycine bracteoles X 4; 4, calyx, laid open X 4; 5, standard X 4; 6, 6', wings X 4; 7, keel-petals X 4; 8, stamens x 4; 9, ovary X 4; 10, ovary, laid open X 4; 11, ovule X 4; 12, fruiting branch, from Perak, *n. s.*; 13, seed, *n. s.*

% 11. **Rubigia** OSae.—*Pod* oblong, samaroid; epicalycine bracteoles obtuse; leaflets large to medium, few; climbers or small trees.

A natural group, standing fairly intermediate between the *fastratae*, which they resemble in foliage, and the *Congestae* and *Polyphyllae*, which they resemble as to epicalycine bracts.

34. DALBERGIA KINGIANA Prain Journ. As. Soc. Beng. Ixvii. 2, 289 (1898)*
lxx. 2, 46 (1901).

A shrub, with lerticelled puberulous branches. *Leaves* 7—8 in. long; leaflets usually 7—9, ovate-lanceolate, acute, base cuneate, coriaceous, green and glabrous above, glaucescent and when young sparsely puberulous at length almost glabrous beneath, the distal leaflet hardly exceeding the rest, 3'5—4 in. long, 1*25—1'5 in. wide, rachis 3—4 in. long and petiolules 2 in. long at first finely puberulous, ultimately quite glabrous. *Flowers* in short axillary panicles, 2*5—3 in. 100°, 2 in. wide; peduncles, branches and short pedicels rusty-tomentose; bracteoles a, base ovate-lanceolate, obtuse, deciduous, epicalycine bracteoles deciduous, spatulate-lanceolate, embracing lower part of calyx-tube; *calyx* campanulate, extremely rusty-tomentose; teeth sub-equal in length, triangular, the two upper sub connate; *corolla* white, petals all long-clawed, standard orbicular, faintly notched, reflexed; *stamens* 9, united in a sheath split along upper side, filaments free in their upper fourth and alternately shorter and longer; *ovary* long-stipitate, quite glabrous, stylo subulate, stigma minute; *ovules* 2.

INDO-CHINA: Burma; Kachin Hills, near Myitkyina, *Skaik Mupml* CHINA: Yunnan-, Szcmiao Mts.; *Uenrij* 12848 I

This species is very closely related to *D. Henryana* from Yunnan; it differs in having a perfectly glabrous ovary and ultimately glabrous leaf-rachis and leaflets which latter are distinctly glaucous beneath. It is also nearly related to *D. Benthami* from Hongkong,

PLATE 37. *Dalbergia Kingiana* Prain.—1, Flowering branch from the Kachin Hills, *n.s.*; 2, bud X 4; 3, calyx, laid open X 4; 4, standard X 4; 5, wings X 4; 6, keel-petals X 4; 7, stamens X 4; 8, ovary X 4; 9, ovary, laid open X 4; 10, ovule X 10.

35. DALBERGIA HENRYANA Prain Journ. As. Soc. Beng. lxx. 2, 46 (1901).

A large woody climber, with closely rusty-pubescent young branches. *Leaves* 4.5—5 in. long; leaflets 4—5, ovate-acute, base cuneate or rounded, coriaceous, glabrous above, softly, rather densely pubescent beneath; the terminal leaflet rather the largest, 1.75—3 in. long, 1—1.5 in. wide; rachis 2—2.5 in. long and petiolules .2 in. long, persistently rusty-puberulous. *Flowers* in short axillary panicles, 2.5—3 in. long, 2 in. wide; peduncles branches and pedicels rusty-tomentose; pedicels .12 in. long with ovate, obtuse, deciduous basal and epicalycine bracteoles, the latter embracing the lower part of calyx tube; *calyx* campanulate, externally rusty-tomentose; teeth triangular, the lowest rather longest, the rest subequal, the two upper subconnate; *corolla* white, petals all long-clawed, standard orbicular, faintly notched, reflexed; *stamens* 9, united in a sheath split along upper side; filaments free in their upper fourth and alternately shorter and longer; *ovary* long-stipitate, pubescent as is the stipe; style subulate, stigma minute; *ovules* usually 2.

CHINA: Yunnan, at Mengtze, 5,000 feet, *Henry* 11,248!

Except in the longer lowest calyx-lobe and the pubescent ovary, this does not differ from *D. Kingiana* as regard flowers. The foliage, however, differs considerably, and it is not yet safe to suggest that the two are conspecific.

PLATE 38. *Dalbergia Henryana* Prain.—1, Flowering branch, from Mengtze, Yunnan, *n.s.*; 2, bud X 4; 3, pedicel with epicalycine bracteoles x 4; 4, calyx, laid open X 4; 5, standard X 4; 6, wings X 4; 7, keel-petals X 4; 8, stamens X 4; 9, ovary X 4; 10, ovary, laid open x 4; 11, ovule X 8.

36. DALBERGIA BENTIUMI Prain Journ. As. Soc. Beng. lxxvii. 2, 289 (1895); lxx. 2, 46 (1901).

D. ruginosa Benth. Journ. Linn. Soc. iv. Suppl. 43 in part (1860); *Flor. Hongkong* 93 (1861); *Forbes & Hemsl. Journ. Linn. Soc.* xxiii. 198 (1887), not of Roxb.

A woody climber, or sometimes a shrub, with very long black glabrous branches. *Leaves* 4—6 in. long; leaflets 5—7, ovate, narrowed to the petiolule and to the obtuse, slightly retuse tip; coriaceous, glabrous above, minutely adpressed-puberulous beneath; the distal the largest, 1.25—2.5 in. long, .75—1.5 in. wide; rachis 2—2.25 in. long and petiolules, .2 in. long, finely adpressed puberulous. *Flowers* in short axillary racemes or panicles, 1.5 in. long, 1 in. wide, peduncles and distinct slender pedicels, .1 in. long, rusty-tomentose, basal bracteoles oblong, deciduous, epicalycine bracteoles short, lanceolate, obtuse, persisting; *calyx* campanulate, externally rusty-tomentose; teeth all subequal triangular obtuse; *corolla* white, petals all long-clawed; standard orbicular, emarginate, reflexed; *stamens* 9, in a sheath split along upper side, filaments free in their

upper third, alternately shorter and longer; *ovary* long-stipitate, glabrous, style subulate; *ovules* 2, or often 3. *Pod* thinly coriaceous, glabrous, stipitate, ligulate, 1—2-seeded 2—3 in, long, *6 in. wide, faintly reticulated opposite the seeds; *seed* reniform, compressed, '45 in. long, -2 in. wide.

CHINA: Hongkong, *Uance* ! *Wilford* ! *Wiigld* \ *Ford* ! *Seemam* ! *Bodinier* ! *Urquhart* ! *Earhnd* 1

The opportunity of peeing the fruits of this species, collected by Bodinier and communicated by Fond, finally settled the impossibility of following Bⁿtham in his identification of it with *D. vubiginosa*.

PLATE 39. *Dalbergia Benthami* Prain.—1, Flowering branch, from Hongkong, *n. s.*; 2, bud X 4; 3, calyx, laid open X 4; 4, standard X 4; 5, wings X 4; 6, keel-petals X 4; 7, stamens X 4; 8, ovary X 4; 9, ovary, laid open X 4; 10, 11, pods, from Hongkong (*Bodinier*), w. \$.; 12, seed, *n. s.*

37. DALBERGTA RUBIGINOSA Roxb- Corora. PL ii. 9, t. 115 (1798); Willd. Sp-Fl. iil 2, 902 (1800); Roxb. Hort, Beng. 98 (1814); Roth Nov. PL Sp. 332 (1821); DC. Prodr. ii. 41G (1825); W. & A. Prodr. i. 265 (1834); Benth. PL Jungh. i. 255 (1851); Journ. Linn. Soc. iv. Suppl. 43 (ref. China excl.) (1860); Bak. in Hook. f. Flor. Brit. Ind. ii. 232 (1876); Prain. Journ. As. Soc. Beng. lxvi. 2, 443 (1897); lxx. 2, 47 (1S01); Cooke Flor. Pres. Bomb, i. 397 (1902).

An extensive climber, with finely puberulous branches, often twisted into thickened hooks. *Leaves* 3—5 in. long; leaflets usually 5, but often 3, less often 7, ovate or elliptic-oblong, obtuse, thinly coriaceous, glabrous above, minutely puberulous beneath, the distal the largest, '75—2*5 in. long, #5—P25 in. wide; rachis 1—2 in. long, -5—P25 in. wide, and petiolules, *15 in. long, pubeiulous. *Flowers* in short axillary racemes or panicles, ^m5—*70 in. long; peduncles and short pedicels, '05 in. long, rustjr-toinentose; basal bracteoles triangular-ovate, persistent, epicalycine bracteoles ovate, embracing lower fourth of calyx-tube; *calyx* campanulate, externally puberulous, slightly gibbous at base; teeth subequal, all obtuse, the two upper rather wider than the three lower; *corolla* white; petals all long-clawed, standard orbicular, emarginate, reflexed; *stamens* 9, in a sleath split along upper side, filaments free in their upper fourth, alternately shorler and longer; *ovary* glabrous, long-stipitate; style subulate, stigma minute; *ovules* 1—3, *Pod* indehiscent, thinly coriaceous, oblong, long-stipitate, 1*25 in. long, '5 in. wide, reticulate opposite the seed; *seed* reniform, much compressed, '5 in. long, '25 in. wide.

INDIA: N. Canara; Ainslie Ghat, *Talboil* Dodmuno, *Talbot*! Nakund, *TalBA* I Concan; *Dalzell*! *Wight* 1 *Stocls* !

PLATE 40. *Dalbergia rubiginosa* Roxb.—1, Flowering specimen, from Concan coast, *n. s.*; 2, young flower X 4; 3, pedicel with epicalycine bracteoles X 4; 4, calyx, laid open X 4; 5, standard X 4; 6, keel-petals X 4; 7, wings X 4; 8, stamens x 4; 9, ovary X 4; 10, ovary, laid open X 4; 11, fruiting twig, from Canara, *n.s.*; 12, fruit opened, with seed *in situ*, *n. s.*; 13, seed, *n. s.*

% 12. *Jftenoeides*.—*Pod* falcate-subreniform, thickened throughout; epicalycine bracteoles obtuse; leaflets few; climber*.

A group that is only subnatural. The two Asiatic species it includes agree as to pods and as to flowers. If general appearance and habit be alone considered and the artificial character afforded by the fruit be neglected, *D. menoeides* ought to be treated as a member of the group *Rubiginosae*, *I. torta* as a member of the group *Congestae*.

38. DALBERGIA MENOEIDES Prain Journ. As. Soc. Beng. lxvi. 2, 120 (1897);
lxvi. 2, 45:j (1897); lxx. 2, 50 (1901).

An unarmed climber, with glabrous, twining, hooked branches. *Leaves* 5 in. long; leaflets 3, ovate-lanceolate, tapering to both ends, dark-green glabrous above, paler sub-glaucous, sparsely adpressed-puberulous beneath, 3—3*5 in. long, 1—1*5 in. wide; rachis 1*5 in. long, glabrous; petiolules very short, puberulous. *Flowers* very few, sessile, clustered at apices of short, puberulous, axillary peduncles, #15—'25 in. long; epicalycine bracteoles ovate, embracing lower third of calyx-tube; *calyx* campanulate, sparingly puberulous externally; teeth short, obtuse, subequal, the two upper slightly connate; *corolla* white, petals all long-clawed, standard suborbicular, slightly emarginate, reflexed; *sfamens* 10, in one sheath split along upper side, filaments free in their upper fourth; *ovary* stipitate, glabrous; stylo subulate, stigma minute; *ovule* solitary. *Pod* semilunar, greenish, flat, glabrous, firm, reticulated throughout, the upper suture recurved; 1*5 in. long, *75 in. wide; apex acute; stipe rather short; *seed* solitary, reniform.

MALAYA: Perak; Krian, *Scortechinil*

PLATE 41. *Dalbergia menoeides* Prain.—1, Flowering branch, from Krian, Perak, *n.s.*; 2, young flower X 4; 3, pedicel with epicalycine bracteoles X 4; 4, calyx, laid open X 4; 5, standard X 4; 6, wings X 4; 7, keel-petals X 4; 8, stamens X 4; 9, ovary X 4; 10, ovary, laid open X 4; 11, ovule X 10; 12, portion of fruiting branch, from Krian, Perak, *n. s.*

39. DALBERGIA TORTA Grah. in Wall. Cat, 5373 (1832); A. Gray Bot. Wilkes Exped. i. 458 (1854); Prain Journ. As. Soc. Beng. lxvi. 2, 120 (1897); Volkens in Engl. Bot. Jahrb. xxxi. 464 (1901); Cooke Flor. Pres. Bomb. i. 397 (1902).

Karin-Tagera Kheede Hort. Malabar, vi. 25 (1686).

Cassia candenaksis Dennst. Schl. zum Hort. Malabar. 12 (1818).

Dalbergia monosperma Dalz. Hook. Journ. Bot. ii. 36 (1850); Benth. PL Jun^oh. i. 256 (1851); Miq. Flor. Ind. Bat. i. 1, 132 (1855); Thw. Enum. 94 (1859); Benth. Journ. Linn. Soc. iv. Suppl. 48 (1860); Flor. Hongkong. 93 (1861); Dalz. & Gibs. Bomb. Flor. 78 (1861); Seemann Flor. Vitens. 64 (1865); Bak. in Hook. f. Flor. Brit. Ind. ii. 337 (1876); Nav. & Fernand.-Vill. Nov. App. Flor. Philip. 67 (1880); Drake del Castillo Illust. Flor. Pacif. 156 (1886); Trim. Ceyl. Flor. ii. 89 (1894); Talbot Bomb. List 75 (1894); Woodr. Journ. Nat. Hist. Soc. Bomb. xi. 426 (1897).

Drepanocarpus monospennus Kurz Journ. As. Soc. Beng. xlv. 2, 281 (1876),
For. Flor. Burm. i. 337 (1877).

Dalbergia candenalis Prain Journ. As. Soc. Beng. lxx. 2, 49 (1901); BCD^o"II
Plants i. 411 (1903).

An unarmed littoral climber, with twining glabrescent branches, often twisted into spiral hooks. *Leaves* 3 in. long; leaflets 5, very rarely 3 or 7, obovate-oblong, obtuse, sometimes emarginate, dark-green glabrous above, paler, sparingly adpressed-pubescent beneath, 6—8 in. long, 4—6 in. wide; rachis 2 in. long, glabrous; petioles 1 in. long, glabrous. *Flowers* in sessile congested axillary panicles, 1—2 in. long, with very slightly puberulous branches; bracts small, ovate-lanceolate; bracteoles at base of pedicels ovate-lanceolate, the epicalycine pair larger, ovate, embracing lower third of calyx-tube; calyx wide campanulate, glabrescent; teeth short, wide-triangular, obtuse, the two upper subconnate; corolla white, petals all long-clawed, standard oblong, reflexed; stamens 9 or sometimes 10, in one sheath split along upper side, filaments free in their upper third; ovary stipitate, glabrous; style subulate, stigma minute; ovules usually solitary, sometimes 2. *Pod* indehiscent flat, brown, falcately recurved along upper suture, rather thick-walled throughout, usually 1-seeded, very rarely 2-seeded, shortly stipitate, 9 in. long or, when 2-seeded, 5 in. long, 5 in. wide; seed reniform, compressed, 4 in. long, 2 in. wide.

MICKONESIA: Carolines, *Volkens*. MELANESIA: Tonga; Vavau, *Croft* Fiji; Viti, *Scamm* 128! New Caledonia; *Pancherl Diplanchel Vcillard* NEW GUINEA: *Forks I* AUSTRALIA: Queensland; Rockingham Bay, *Dallachyl* Cape York, *Darnell* Northern Territory; Port Darwin, *Schultz* 744! PHILIPPINES: Luzon, Batangos, *Cuming*! *Vidal* Manila, *Ginning I* Ilo-Ilo; Panay, at Igbaras, *Naves of Fernandez-ViUar*. MALAYA: Moluccas, Amboina, *Forsterl* Ceram Laut, *Forsterl* Warburg I Celebes; Lepo-Lepo near Kandari, *Bcccaril* Borneo; Sarawak, *Bcccaril* Igau, *Bcccaril* Bintulu, *Ilavilandl* Biliton; *Blimbon*, *Tnjsmannl* Sumatra; Indrapara, *Korhalsl* Miller I Singapore; *WaUichl* Kurzl *Anderson* *Ridley I* *Fichura I* Malacca; *Rialey I* Perak; *Scortechini I* Wray! Penang; *Wallich* *Cur tit*! Langkawi; *Curtis I* CHINA: Hongkong, *Ilancel* Little Hongkong, *Ford I* INDO-CHINA: Tongking, *Balansa I* Annam; Haton, *Godefroy I* Cambodia; near Saigon, *Lefevre*! Tenasserim; Mergui, *Griffith I* Amherst, *Falconer I* Martaban, *Wallich* Andamans; Narcondam, *Prainl* S. Andaman, *Man I* *IlcLigl* INDIA: Sundribuns, *Clarke I* *Ileinig* *Prainl* Ceylon; Pandure, Tiincomali, and Kodyar, *Thwaites I* *Trimen I* Malabar-Candiate, *Rheede*) Quilon, *Wight I* Concan; *Slocks!* *law I*

This is known to the wood-cutters of the Sundribans as *Panchloli*; the Annamese name is *Caymcmuk*; the Cambodian is *BaUtuk*.

PLATE 42. *Dalbergia torta* *Grah.*—1, Flowering branch, from S. Andaman, *n.s.*; 2, flower X 4; 3, epicalycine bracteoles X 4; 4, calyx, laid open X 4; 5, standard X 4; 6, wings X 4; 7, keel-petals X 4; 8, stamens X 4; 9, ovary x 4; 10, ovary, laid open X 4; II, ovule X 6; 12, twig, showing hooked branches, from Martabani *n.s.*; 13, branch with fruit, from the Sundribuns, *n. s.*; 14, pod, laid open, showing seed, *in situ*, *n. s.*; 15, seed, *n. s.*

^ 13. **Congestae.**—*Pod* ovate, samaroid; epicalycine bracteoles obtuse; leaflets many to small, few or many; climbers.

A fairly natural group because, though their leaflets are of different shape and their pods are somewhat dissimilar, the general habit of *D. congesta* and *D. Gardneriana* is the same; indeed, the two species have so much in common that an author so careful as Mr. Baker has suggested their union. An examination of the figures of the two will, however, show that this is not a proposal

which is convenient. On the other hand, though the number and size of the leaflets be different, *J.* *Gardneriana* and *D. malabarica* are very closely related in every essential character. It is to Beddome that the suggestion that *D. malabarica* is a distinct species is originally due, as a specimen in the Kew collection testifies; that specimen, however, has no fruits, so that Oliver and Baker, who have dealt with it, did not feel justified in giving it the specific rank proposed by Beddome. Fuller material now amply proves the justice of Beddome's original opinion, and demonstrates that while *D. malabarica* no doubt forms a connecting link between the *Congestae* and the *Polyphyllae*, it is to the former rather than to the latter group that it is most nearly allied. A recently discovered Bornean species, *D. Hoseana*, seems to serve as a further connecting link between the two groups.

40. DALBEEGIA CONGESTA Grab, in Wall. Cat. 5872 (1832); W. & A. Prodr. i. 265 (1834); Benth. PI. Jungb. i. 255 (1851); Journ. Linn. Soc. iv. Suppl. 43 (1860); Bak. in Hook. f. Flor. Brit Ind. ii. 232, syn. *D. Gardneriana* excl. (1876); Prain Journ. As. Soc. Beng. lxx. 2, 47 (1901).

A strong climber or an erect shrub with wide-spreading branches, sometimes a tree up to 30 feet high; young branches pubescent. *Leaves* 3—5 in, long; leaflets 5—11, cuneate-ovate, apex emarginate, thinly coriaceous, sparsely adpressed-pubescent on both surfaces, the distal rather the largest, 75—1*75 in. long, #4—1 in. wide; rachis 2—3 in, long, pubescent as are the short petiolules. *Flowers* in congested or open axillary panicles 5—2 in. long, 3—15 in. wide; branches and short pedicels rusty-pubescent; basal bracteoles ovate, epicalycine bracteoles ovate-acute, embracing lower third of calyx-tube,—all rusty-pubescent; *calyx* campanulate, glabrescent, slightly gibbous at base; teeth subobtusely subequal except the lowest longer and acute, the upper two subconnate; *corolla* white, petals long-clawed, standard orbicular, emarginate, reflexed; *stamens* 9, in a sheath split along upper side, filaments free in their upper fourth, alternately shorter and longer; *ovary* glabrous, stipitate; stylo subulate, stigma minute; *ovules* 2. *Pod* indehiscent, firmly coriaceous, ovate, shortly stipitate, glabrous, much reticulated opposite the solitary seed, 2 in. long, 8 in. wide; *seed* reniform, compressed, not seen mature,

INDIA: Nilgiris; Coonoor, *Notonl Gamble] Branadisl Prainl* INDO-CHINA: Burma; Chin Hills, *Prazerl*

PLATE 43. *Dalbergia congesta* Grab.—\, Flowering branch, from Coonoor, *?.*.; 2, bud X 4; 3, pedicel with basal and epicalycine bracteoles X 6; 4, calyx, laid open X 4; 5, standard X 4; 6, wings X 4; 7, keel-petals X 4; 8, stamens X 4; 9, ovary X 4; 10, ovary, laid open X 4; 11, ovule x 10; 12, fruiting branch, from Chin Hills, *n.s.*; 13, pod, opened, showing young seed *in situ* *n. s.*

41. DALBERGIA GARDNLKIANA Benth. Journ. Linn. Soc. iv. Suppl. 42 (1860); Prain Journ. As. Soc. Beng. lxxvi. 2, 444 (1897); kx. 2, 47 (1901).
D. congesta Bak. in Hook. f. Flor. Brit. Ind. ii. 232 in part (1876), not of Benth.

A climber, with densely rusty-tomentose branches. *Leaves* 2*75—3"5 in, long; leaflets 7—11, oblong-elliptic, obtuse or retuso, coriaceous, glabrous above, densely rusty-tomentose beneath,—all subequal, 1 in. long, 6 in. wide; rachis 2—2'5 in. long, densely rusty-tomentose as are the short petiolules. *Flowers* in short, sessile, axillary cymes,

*0—⁵ in. long, -3—4 in. wide; short pedicels densely rusty-tomentose; basal bracteoles ovate, epicalycine ovate-oblong, densely rusty-tomentose; *calyx* campanulate, slightly gibbous at base; teeth subequal, all subobtuse, the two upper subconnate, rather wider than the others; *corolla* white, petals all long-clawed, standard orbicular, emarginate, reflexed; *stamens* 9, in a sheath split along upper side; filaments free in their upper fourth; *ovary* villous, stipitate; style subulate, stigma small; *ovules* 1—2. *Pod* indehiscent, thinly coriaceous, narrow-oblong, long-stipitate, brown, shining, reticulated throughout, but especially opposite the seeds, 1⁵ in. long, [#]5 in. wide; *seed* solitary, compressed, ovate, '4 in. long, '2 in. wide.

INDIA: Nilgiris; *Gardner* \ *Mete* I *Wight*] *G. Thomson*] *Clarke*] *Gamble*] *Perrottet*

It has been suggested by Mr. Baker that this is a variety of *D. congesta*. It is, however, more nearly related to *D. malabarica*, which is treated by Mr. Baker as a form of *D. tamarindifolia*.

PLATE 44. *Dalbergia Gardneriana Benth.*—1, Flowering branch, *n. s.*; 2, bud X 4; 3, pedicel and epicalycine bracteoles X 4; 4, calyx, laid open X 4; 5, standard X 4; 6, wings X 4; 7, keel-petals X 4; 8, stamens X 4; 9, ovary X 4; 10, ovary, laid open X 4; 11, ovule X 10; 12, fruiting branchlet, *n. s.*; 13, pod, laid open with seed ~~in situ~~, *n. s.*; 14, seed, *n. s.*

42. DALBERGIA HOSEANA Prain sp. nov.

A shrubby climber, with rusty-velvety young branches. *Leaves* 2—3⁵ in. long; leaflets 9—13, thinly pubescent above, more densely tomentose, especially on the rusty midrib beneath, crowded, elliptic to ovate-lanceolate, hardly or not oblique at the base, '35—'6 in. long, -25—35 in. wide, membranous; rachis 1⁵—3 in. long, densely rusty-pubescent, as are the very short petiolules; stipules lanceolate, rusty-pubescent. *Flowers* appearing with the leaves in small, lax, few-flowered, axillary corymbs, -6 in. long, '5 in. wide; peduncles '2 in. long and very slender pedicels densely pubescent; basal bracteoles ovate-lanceolate, persistent, epicalycine bracteoles lanceolate, persistent, pubescent; *calyx* campanulate, glabrous except on margins of teeth, which are much shorter than the tube; all obtuse, the two upper teeth connate; *corolla* white, '35 in. long, petals all long-clawed; standard narrowly ovate, entire, reflexed; *stamens* 9, in one sheath split along upper side, filaments free in their upper fourth; *ovary* long-stipitate, quite glabrous as in the stipe; style filiform, stigma minute; *ovule* solitary.

MALAYA: Borneo; Kuching, *Ilaviland Sf Hose* 3375!

A very distinct species, nearest to *D. malabarica* which it connects with the remaining *Cotigestae*, but easily recognized by its fewer thinner leaflets and its somewhat different calyx.

PLATE 45. *Dalbergia Hoseana Prain.*—I, Flowering branch from Kuching, Borneo, *n. s.*; 2, bud X 4; 3, flower X 4; 4, pedicel and bracteoles X 4; 5, calyx, laid open X 4; 6, standard X 4; 7, wings X 4; 8, keel-petals X 4; 9, stamens X 4; 10, ovary X 4; II, ovary, laid open X 4; 12, ovule X 10,

43. DALBERGIA MALABAKICA Prain Journ. is. Soc. Beng. Ixx. 2, 48 (1901).

D. tamarindifolia VAR. *pubescens* Bak. in Hook. f. Flor. Brit, Ind. ii# 235 (1876),
Cooke Flor. Pros. Bomb. i. 399 (1902).

A shrubby climber, with densely rusty-pubescent young branches. *Leaves* 3*5—4 in. long; leaflets 21—31, thinly pubescent above, densely tomentose beneath, crowded, elliptic-oblong, hardly or not oblique at the base, "5 in. long, '25 in. wide, moderately firm; rachis 3—3'5 in. long, densely pubescent, as are the very short petiolules; stipules lanceolate, rusty-pubescent. *Flowers* appearing with the leaves, in densely-congested sessile axillary corymbs, #5 in. long, "25 in. wide; peduncles densely pubescent, pedicels glabrous; basal bracteoles triangular-ovate, persistent, epicalycine bracteoles ovate-lanceolate, obtuse, persistent, pubescent; *calyx* campanulate, glabrous except on margins of teeth, which are nearly as long as tube, the 3 lower acute, the 2 upper connate, obtuse; *corolla* white, *33 in. long, petals all long-clawed, standard ovate, entire, reflexed; *stamens* 9, in one sheath split along upper side, filaments free in 'their upper third; *ovary* glabrous except along upper suture; stipe long, pubescent; style filiform, stigma minute; *omles* 2. *Pod* indehiscent, ovate-oblong, very thinly coriaceous, glabrous, long-stipitate, 1*23 in. long, *6 in. wide, distinctly reticulately veined, especially opposite the seed.

INDIA: Concan; *Stocks!* Canara, *Talbot* 408! 3665! Quilon, *Wijht* \ S. Tinivelly, *Beidome* I

PLATE 46. *Dalbergia malabarica* *Praia*.-*!, Flowering branch from Siddapore, N. Canara, *n. s.*; 2, epicalycine bracteoles X 4; 3, calyx, laid open X 4; 4, standard X 4; 6, wings X 4; 6, ked-petals X 4; 7, stamens X 4; 8, ovary X 4; 9, ovary, laid open X 4; 10, fruiting twig, from Halihal, N. Canara, *n. s.*; 11, young seed, *n. s.*

^ 14. **Polyphylla**Q.—*Pod* *Ugidalc*, *samaroid*, with parallel sides; *epicalycine bracteoles* *cltuse*; *leaflets* small to medium, rarely large, usually many; *climbers*, rarely mill trees.

A. very natural group forming the core, so to epoak, of the section *Endesprum*, recognized by Blume, but by few subsequent authors, as a distinct genus. While fairly uniform in general habit, one of the species, *D. c/ens'i*, in certain localities develops larger and at the same time fewer leaflets than usual, and so brings the group into contact with the *Rubijinosas* and *Rostratae* at one extremity of the serie3 of species it includes, much as *D. acaoiae/olia* or *D. polyphylla* approach *D. malabarica* and the *Conyestae* generally at the other extremity.

44. DALBERGTA ACAGIEFOMA Dalz. in *Kc\y Journ.* ii. 37 (1850); Benth. *PL Jungh.* i. 256 (1851).
D. tatzrihdifolia Benth. *Journ. Linn. Soc.* iv. *Suppl.* 44 in part (1860), not of Roxburgh.
D. tamarind'ifolia VAR. *acariaefoia* Bak. in *Hook f. Flor. Brit. Ind.* ii. 235 (1876); *Cooke Flor. Bomb. Pres.* i. 899 (1902).

A shrubby climber, or a tree with weak spreading branches; branchlets finely puberuloua. *Leaves* 5—6 in. long; leaflets 41—51, quite glabrous, dark-green above, glaucescent, finely adressed-pubescent beneath, crowded, linear-oblong, base and midrib oblique, apex retuse, firmly coriaceous, caducous, '6 in. long, -2 in. wide; rachis 4*5—5-5 in. long, puberulous; petiolules puberulous, very slioit. *Flnvers* with the leaves, in rather lax axillary panicles with corymbose branches, 1—2 in. long, 1 in. wide; peduncles, branches and pedicels finely puberulous; epicalycine bracts rather large, ovate, embracing lower third of calyx-tube; *calyx* campanulate, slightly gibbous, rusty-pubescent externally; teeth shorter than tube; all obtuse, the two upper subconnate; *corolla* white,, petals

all long-clawed, standard orbicular-oblong, much reflexed and markedly auriculate at base of limb; *stamens* 10, in one sheath split above; *ovary* glabrous, distinctly stipitate*, style 6-limbed; *ovules* 2. *Pod* indehiscent, ligulate, obtuse, very firmly coriaceous, indurated and thickened opposite the seed, but not veined there or elsewhere, long-stipitate, 2-25 in. long, 1-6 in. wide; *seed* solitary, compressed, reniform.

INDIA: Concan; *Laliv* Canara; Dodmune, *Talbot* Tinivelly Hills, *Naidool*

PLATE 47. *Dalbergia acaciaefolia* Dab.—1, Flowering branch, from the Concan, *n. s.*; 2, bud X 4; 3, calyx, laid open X 4; 4, standard X 4; 5, wings X 4; 6, keel-petals X 4; 7, stamens X 4; 8, ovary X 4; 9, ovary, laid open X 4; 10, ovule X 10; 11, fruit, from the Concan, *n. s.*

4.5. DALBERGIA TAMARINDIFOLIA Roxb. Hort. Beng. 53 (1814); Flor. Ind. iii. 233 in part (1832); Wall. Cat. 5870 (1832); Wight Ic. t. 242 (excl. fruit) (1840); Voigt Hort. Suburb. Calcutt. 241 (1845); Benth. PI. Jungh. i. 256 (1851); J.Jiq. Flor. Ind. Bat. i. 1, 131 (1855); Benth. Journ. Linn. Soc. iv. Suppl. 44 (1860); Bak. in Hook. f. Flor. Brit. Ind. ii, 234 (1876); Kurz Journ. As. Soc. Bong. xlv. 2, 281 (1876); For. Flor. Burm. i. 348 (1877). Nav. & Femand. Vill. Nov. App. Flor. Philip. 07 (1880); Vidal Plant Vase. Filip. iii (1886); Woodr. Journ. Nat. Hist. Soc. Bomb. xi. 426 (1897); Prain Journ. As. Soc. Beng. lxxvi. 2, 117 (1897); lxx. 2, 49 (1901); Cooke Flor. Pres. Bomb. i. 398 (1902); Prain Bengal Hants i. 411 (1903).

J. rufa Grab, in Wall. Cat. 5864 (1832).

J. multijurja Grah. in Wall. Cat. 5805 (1832); Zoll. & Mor. Syst. Verzeichn. 2 (1845).

*D. livida** Wall. Cat. 5866 in part (1832), not of Grah.

D. Bhmci Hassk. Cat. Hort. Bog. 284 (1844); PI. Jay. Ear. 400 (1818).

Endespennum scandens Bl. Cat. Gew. Buitenzorg 92 (1823); Flora viii 1 132 (1825).

E. rciusum Bl. ex Miq. Flor. Ind. Bat. i. 1, 131 (1855).

An erect tree 15—40 feet high, with long flexuous sarmentose branches, or a shrubby climber, with densely pubescent young branches. *Leaves* 5—6 in. long; leaflets 25—41, thinly pubescent on both sides, rather paler beneath, crowded, trapezoid-oblong, 6—75 in. long, 3 in. wide, moderately firm, caducous; rachis densely puberulous, 4-5-5-5 in. long; petiolules very short; stipules lanceolate, 2 in. long, densely puberulous. *Flowers* appearing with the leaves, in congested sessile or shortly peduncled axillary panicles with corymbose branches, 5—2 in. long, 5—1 in. wide; peduncles, branches and pedicels densely puberulous; bracts and bracteoles at base of pedicel and under calyx ovate, puberulous, persistent; *calyx* campanulate, pubescent externally (in Himalayan) or glabrescent (in Indo-Chinese and Malayan specimens), pale greenish-yellow; teeth ovate, the two upper subconnate; *corolla* white, petals all long-clawed, standard ovate, reflexed; *stamens* 9—10, in one sheath split above; *ovary* glabrous, stipitate; style narrow; *ovules* 2—3. *Pod* indehiscent, thin, greenish, drying bright-brown, glabrous, long, stipitate, ligulate, subacute, 1-3-seeded; uniformly finely reticulate, 1-5-3 in. long, 1—0 in. wide; *seed* narrow, nearly straight, 7 in. long, 15 in. wide.

HIMALAYA: Nepal; *Wallich*] Sikkim; *Hooker* \ *Lister* | *Prairie* CHINA: Yunnan; Szemaa Mts. 4,500 feet elev., *Henry* 12147! INDO-CHINA: Assam; Sibsagor, Goalpara, Gauhati, *Simons*] *Peal* *Uenkinsl* *Mann* \ *Clarke*] *JFatfl* *Silhet*, *Gomes*] Naga Hills, *Abdul Huq* \ *Watt* | Chittagong; Kodala, *Badal Khan*] Burma; Kachin Hills, Sadon, *Shaih Muqiml* Taping Valley (politically Chinese) between Poncshee and Tapen Khyong, *J. Anderson* | Tenasserim; Maulinein, Amherst, *Wallich*] *Griffith*] *Heifer*] *Falconer*] Andamans; S. Andaman, *Man* \ *Kurz* \ Barren Island, *Prairie*] PHILIPPINES: Luzon; Morong, *VidaV*. San Mateo, *Naves & Fernandez Villar*. MALAYA: Langkawi, *Curtis*] Penang, *Wallich* \ Perak, *Scortechinil* *Eunstlerl* *Wrayl* *Ridley*] Malacca, *Maingay*] *Derryl* Sumatra, *Korihahl* *Forbes*] Java, *Horsfield*] *Ploem*] *Zalliger*] Borneo, *Korthals*] *Motley*! *Creaghl* *Havilandl*

Derris pinnata Lour., Mor. Cochin-China, 432 (1790), is often referred to this species. From Loureiro's description his plant is clearly a *Lalbergia*, but that it is not *D. tamarindiolia* is almost certain, because Loureiro's plant has glabrous leaflets, which, even when they are mature, *D. tamarindifolia* never has. Another, though perhaps less valid, objection to the identification is that *D. tamarindifolia* does not appear to have been collected in Cochin-China.

For some reason that is not quite clear *Endespcrmm scandens* Bl. has been considered a doubtful species, and in the *Index Keircns's* has been tentatively referred to *D. Championii*, i.e., to *D. mstrala*. The description given by Blume is so very precise that no dubiety is possible; the numerous leaflets, pubescent on both side?, and the roundish epicalycine bracts are characters that alone suffice to make the suggestion alluded to impossible; the shape of the leaflets (oblique at the "base, rounded on the upper, cuneiform on the lower side) indicates that Blume's plant can only be *D. tamarindiolia* among the Malayan *Dalbergias*.

PLATE 48. *Dalbergia tamarindifolia* Rozb.—1, Flowering branch, from Assam, *n. s.*; 2, bud X 4; 3, calyx, laid open X 4; 4, standard, from in front and from behind X 4; 5, wings X 4; 6, keel petals X 4; 7, stamens X 4; 8, ovary X 4; 9, ovary, laid open X 4; 10, ovule X 8; 11, fruiting twig, from Perak *n. s.*; 12, pod, laid open, showing seed *in situ*, *n. s.*; 13, seeds, *n. s.*

46. DALBERGIA POLYPHYLLA Benth. PL Jungh. i. 256 partly (1851); Journ, Linn. Soo, iv. Suppl. 44 partly (1860); Nav. & JTornand. Yill. Nov. App. Flor. Philip. 67 (1880); Vidal Phan. Cuming. Philipp, 38, 109(1885); Rev. Plant. Vase. Filip. 114 (1886); Piain Journ. As. Soc. Bcng. lxx. 2, 48 (1901).

D. volubilis Llanos Mem. Acad. Cienc. Madr. (1858); App, Ad, Flor. Philip. Blanco Ed. iii. iv. 103 (1880) possibly,

A climbing shrub, with much lenticelled branches, puberulous when young. *Leaves* 3—4 in. long; leaflets 25—49, crowded, glabrous above, thinly pubescent beneath, linear-oblong or narrow-ovate, rounded equal or very slightly oblique at base, rounded or rarely sub-acute at apex, 5 in. long, *15—*2 in. wide, moderately firm, readily falling; rachis puberulous, 2*5—3 5 in. long, petiolules very short; stipules very narrowly lanceolate, rusty-pubescent, caducous. *Flowers* rather before the leaves, in congested sessile lateral panicles with corymbose branchlets, #5—1*5 in. long, *5—1 in. wide, peduncles and pedicels puberulous; basal and epicalycine bracteoles rather large, ovate, the latter embracing lower fourth of calyx-tube; *calyx* campanulate, glabrescent; teeth short triangular, obtuse, the two upper sub-connate; *corolla* white, petals all long-clawed; standard suborbicular, slightly emarginate, reflexed; *stamens* 9—10. in one sheath split along upper side.; *ovary*

glabrous, long-stipitate; style subulate, stigma minute; ovules 1—2. Pod indehiscent, coriaceous, distinctly stipitate, ligulate, rounded at both ends, 2 in. long, $\frac{1}{5}$ in. wide, usually 1-seeded, reddish-brown; seed narrow-oblong, $\frac{1}{5}$ in. long, $\frac{1}{15}$ in. wide, hardly reniform.

PHILIPPINES: Luzon; *Cuming 11611 Vidal 25891 Loher 2232! 2240!* Angat; Llanos.

Yidal gives the name in Luzon as *Payan*. Llanos says that the pod of his *D. volubilis* is linear; *D. pohj2)iylla* is the only Philippine *Dalbergia* so far known to the pods of which this epithet could be applied; the identification suggested is, however, merely tentative and the recognition of Llanos' plant must be left to botanists in the Philippines.

PLATE 49. *Dalbergia polyphylia Benth.*—1, Portion of flowering branch, from Luzon (*Cuming 1164* in Herb. Berol.), *n. s.*; 2, portion of flowering branch, from Luzon (*Loher*), *n. s.*; 3, pedicel with epicalycine bractcoles X 4; 4, calyx, laid open X 4; 5, standard X 4; 6, wings X 4; 7, keel-petals X 4; 8, stamens X 4; 9, ovary X 4; 10, ovary, laid open X 4; 11, ovule X 10; 12, pod, from Luzon [*Loher*] *n. s.*; 13 pod, laid open, showing seed *in situ*, *n. s.*; 14, seed, *n. s.*

47. DALBERGIA JAHERII Buerck ex Prain Journ. As. Sec. Beng. Ixx. 2, 47(1901).

A large shrubby climber, with glabrous branches. Leaves 4—6 in. long; leaflets 15—23, ovate-oblong, base faintly obliquely cuneate, apex rounded or slightly emarginate, chartaceous, green above, slightly glaucescent beneath, finely sparsely adpressed-pubescent on both surfaces, $\frac{1}{75}$ — $\frac{1}{5}$ in. long, $\frac{1}{3}$ — $\frac{1}{6}$ in. wide; rachis 3—5 in. long, and petiolules $\frac{1}{15}$ in. long, glabrous. *Flowers* in congested axillary panicles $\frac{1}{25}$ in. long, 1 in. wide; peduncles, branches, and pedicels $\frac{1}{1}$ in. long, pubescent; bractcoles ovate, obtuse, puberulous; calyx campanulate, glabrous; teeth small, triangular, obtuse or subacute; corolla white, petals all long-clawed, standard orbicular, emarginate, reflexed; stamens 10, in one sheath split along upper side; ovary glabrous, long-stipitate; style subulate, stigma minute; ovules 1—2. Pod indehiscent, narrow-oblong, rather firmly coriaceous, distinctly stipitate, $\frac{1}{5}$ — $\frac{1}{2}$ in. long, $\frac{1}{5}$ in. wide; seed reniform, narrow, solitary or often 2.

PAPUASIA: Key Archipelago, *Wariurg 20312! Jaherl*

PLATE 50. *Dalbergia Jaherii Buerck.*—1, Flowering branch from Key archipelago, *n. s.*; 2, bud X 4; 3, pedicel with epicalycine bractcoles X 4; 4, calyx, laid open X 4; 5, standard X 4; 6, wings X 4; 7, keel-petals X 4; 8, stamens X 4; 9, ovary X 4; 10, ovary, laid open X 4; 11, ovule X 6; 12, fruiting twig, from Key archipelago, *ft. s.*

48. DALBERGIA BURMAKICA Prain Journ. As. Soc. Beng. Ixvi. 2, 418 (1897); kx. 2, 47 (1901).

A tree 20—25 feet high, with wide-spreading branches, or a climber; branchlets puberulous. Leaves 5—7 in. long; leaflets 9—13, when young narrowly ovate-acute, when full-grown oblong, obtuse or retuse, slightly unequal at the base, $\frac{1}{5}$ — $\frac{1}{2}$ in. long, $\frac{1}{6}$ — $\frac{1}{8}$ in. wide; dark-green, at first closely pubescent on both surfaces, ultimately quite glabrous above and very sparingly pubescent beneath; stipules small, lanceolate, very caducous; rachis 4—5 in. long and petiolules $\frac{1}{1}$ in. long, glabrous. Flowers in dense lateral panicles with corymbose branches, appearing shortly before the leaves,

1*25 in. long, 1 in. wide; peduncles, branches and pedicels rusty-pubescent; bracteoles at base of pedicels and under calyx lanceolate, acute; *calyx* campanulate somewhat gibbous at base, externally rusty-pubescent; teeth subequal, acute, the two upper rather wider than the three lower; *corolla* purple, '25 in. long, petals long-clawed, standard orbicular, emarginate, reflexed; *stamens* 9, in one sheath split along upper side, filaments free in their upper fourth; *ovary* glabrous, stipitate; style slender, stigma small; *ovules* 1 — 3. *Pod* thin, glabrous, subligulate-oblong, stipitate, uniformly widely but very distinctly reticulate throughout, rather distinctly margined along two-thirds of upper suture, rounded at both ends; 1- or 2-seeded; 3—3*75 in. long, .7 in. wide; *seed* compressed, narrowly oblong, #5 in. long, '25 in. wide; testa brown, dull.

INDO-CHINA: Burma, Ruby mines, *Abdul Iluql* Chin Hills, *Ditn* CHLVA: Yunnan; Szcmiao Mts., 5,000 feet elev., *Henry* 11740!

The nearest ally of this species is *Dalbergia Jaherii* Buerck, from Papuasias, which is most easily distinguished by its smaller leaflets and its glabrescent calyx. The flowers are stated by the native collector to be purple; those of *D. Jaherii* are white.

PLATE 51. *Dalbergia burmanica* Train.—1, Flowering branch, from Ruby mines district, Upper Burma, *n. s.*; 2, flowering branch, Chin Hills, *n. s.*; 3, bud X 4; 4, pedicel with bracteoles X 4; 5, calyx, laid open X 4; 6, standard X 4; 7, wings X 4; 8, keel-petals X 4; 9, stamens X 4; 10, ovary X 4; 11, ovary, laid open X 4; 12, ovule X 10; 13, twig with fruit, from Szcmiao Mts., Yunnan, *n. s.*; 14, seed, *n. s.*

49. DALBERGIA PIERRKANA Prain, sp. nov.

A shrubby climber, with densely tawny-pubescent young branches. *Leaves* 6—7 in. long; leaflets 17—19, ovate-oblong, base faintly obliquely cuneate, apex rounded obtuse, chartaceous, densely velvety-pubescent beneath, more sparingly above, dark-green above, paler beneath, 1 in. long, .75 in. wide, the terminal rather longer (1*3 in. long) and subacute with subequal narrowly cuneate base; rachis 5-5*5 in. long, and petiolules .07 in. long, densely tawny pubescent; stipules small, lanceolate, caducous. *Flowers* in short axillary panicles 1*5 in. long, #5 in. wide; rachis, branches and slender pedicels, .1 in. long, densely tawny-pubescent; *calyx* campanulate, tomentose, "15 in. long; teeth triangular, short, subequal; *corolla* white, standard not seen, claws of wings and keel-petals as long as the calyx-tube; *stamens* 10, in one bundle split along upper side; *ovary* (not seen young) glabrous except the long, sparingly pubescent stipe; style subulate, stigma minute; *ovules* 2. *Pod* rather narrow-oblong, distinctly stipitate, with rounded apiculate tip, quite glabrous, 2—2*75 in. long, #5 in. wide, very thin; usually 1 seeded, occasionally 2 seeded; *seed* reniform, compressed.

INDO-CHINA: Cambodia; Samrong, on Mt. Gruavi, *Pierre* 1037!

A very distinct species, in general appearance remarkably like *D. vehtina*, but differing in the email deciduous stipules, in the shape of the leaflets and in the flowers which are those of a genuine *Endt'spermum*. Its nearest allies are *D. bunmanica* and *D. Jaherii*, but it is easily distinguished from both by its pubescence. *D. malabarica* and *D. Eoseana* are also fairly close allies, but from the first it is readily distinguished by its larger leaflets, open panicles, and different pods; from the second by its larger and more numerous leaflets, its larger panicles, and its smaller and less persistent stipules.

PLATE 52. *Dalbergia Pierreana* Prain.—1, Leafy twig, from Mt. Gruavi, prov. Samrong, Cambodia, *n. s.*; 2, fruiting twig, from same locality, *n. s.*; 3, calyx, laid open X 4;

4, stamens X 4; 5, keel-petals X 4; 6, fruit, laid open, showing seed *in situ*, *n. s.*; 7, seed, *n. s.*

50. DALBERGIA Densa Benth. Lond. Journ. Bot. ii. 217 (1843); PI. Jungh. i. 255 (1851); Miq. Flor. Ind. Bat. i. 1, 128 (1855); Benth. Journ. Linn. Soc. iv. Suppl. 43 (1860); Flor. Austral. ii. 271 (1864); F. von Muell. Pap. PI. (1875); Schum. in Engl. Bot. Jahrb. ix. 202 (1888); Schum. Flor. Kais. Wilhelmsl. 202 (1889); Warb. in Engl. Bot. Jahrb. xiii. 329 (1891); Bailoy, Queensland Flora, 443 (1900); Schum. & Laut. Flor. Deut. Schutzgeb. Sueds. 359 (1901); Prain Journ. As. Soc. Beng. lxx. 2, 47 (1901).

A climbing shrub, or a small tree with weak and climbing branches; branchlets closely lenticelled. *Leaves* 6—8 in. long; leaflets 3—15, broadly oblong or oval or elliptic, obtuse or retuse, glabrous above, minutely thinly pubescent beneath, *lanceolate*, 1.5—2.5 in., rarely 2—3 in. long, 0.5—0.75, rarely 1.5 in. wide; rachis about 3 in. long, petiolules 1.5 in. long, glabrous or pubescent. *Flowers* secund or subsecund, in short axillary panicles 1.5—2 in. long; peduncles pubescent or pubescent; pedicels slender or stoutish, 1—2 in. long; basal and epicalycine bracteoles ovate, puberulous externally; *calyx* campanulate, slightly gibbous; teeth rounded except the narrowly triangular lowest, shorter than the tube; *corolla* white, petals all long-clawed, standard reflexed, narrowly cucullate, emarginate at the tip; *stamens* 9, in one sheath split along upper side, filaments free in their upper fourth; *ovary* sparsely strigose or glabrous; style subulate, stigma minute; *ovules* 2. *Pod* (only seen in VAR. *australis*) thin, glabrous, light-brown, long-stipitate, strap-shaped, obtuse, rather firmly coriaceous, very faintly reticulated opposite the 1—2 seeds; *seed* usually solitary, sometimes 2, narrowly reniform, much compressed, 0.5 in. long, 0.2 in. wide, pale-brown.

VAR. *typica*: *leaflets* usually 7—9, occasionally 11, rarely 3—5, slightly puberulous beneath; young branches and panicles slightly pubescent; *ovary* strigosely hairy.

PAPUASIA: Moluccas; Amboina, *Teysmann* 5120! Jobie Island, north of New Guinea, *Barclay* \ Key archipelago; Kcteil at Tual, *Beccaril* Aru Islands; *Warburg* I New Guinea; without exact locality, *Hinds*! Kaiser Wilhelmsknd, *Ilollrung* 84! 174! 477!

VAR. *australis*: *leaflets* usually 11—15, rarely 9—10, considerably smaller, more closely pubescent beneath; young branches and panicles densely pubescent; *ovary* glabrous.

AUSTRALIA: Possession Island, *R. Brown*! Prince of Wales Island, *R. Brown* I Albany Island, *Still* Torres Straits, *Mosely*! Stuart's River (*von Mueller*) \ Queensland, without exact locality (*Bailey*)!

The Stuart's Eivor specimens are named by Baron von Mueller, no collector's name is given; the specimens from Queensland were kindly presented by Mr. F. M. Bailey; they are the only ones with fruit in Herb. Calcutta. The fruit of VAR. *typica* the writer has not seen; its larger, fewer and less pubescent leaflets with its strigose ovary make it necessary for the present to consider it varietally distinct from the southern form. The specimens from German New Guinea are, however, very nearly intermediate between those from Australia and those from the Moluccas.

PLATE 53. *Dalbergia densa* Benth. VAR. *typica*.—1, Flowering branch, from the Moluccas, *n. s.*; 2, flower with basal and epicalycine bracteoles X 4; 3, calyx, laid open X 4; 4, standard X 4; 5, a wing-petal X 4; 6, a keel-petal X 4; 7, stamens X 4; 8, ovary X 4; 9, ovary, laid open X 4.

PLATE 54. *Dalbergia densa* Benth. VAR. *australis* Prain.—1, Flowering branch, from Queensland, *n. s.*; 2, pedicel with basal and epicalycine bracteoles X 4; 3, calyx, laid open X 4; 4, standard X 4; 5, wings X 6; 6, keel-petals X 4; 7, stamens X 4; 8, ovary X 4; 9, ovary, laid open X 4; 10, ovule X 10; 11, part of a fruiting branch from Queensland, *n. s.*; 12, single pod, laid open to show seed *in situ*, *n. s.*; 13, seed, *n. s.*

§ 4. **MISCOLOBIUM**.—Standard reflexed, but not distinctly refracted, the claw tapering gradually into the blade; stamens normally monadelphous; pod samaroid, rather narrow-oblong.

This section is not so well represented in Asia as it is in America. It stands practically intermediate between *Endespermum* and *Dalbergaria*, having the stamens of the former and the corolla of the latter.

^| 15. **Velutinse**.—*Epicalycine bracteoles obtuse or acute, shorter than the calyx; leaflets medium to small, not exceeding 2 in. long; style subulate; climbers.*

A natural group apparently more nearly related to some American forms, especially perhaps to *D. (Mimolobium) foliolosa* of Brazil and Bolivia, than to any of the remaining Asiatic species. This group, agreeing as it does with the *Endesperma* as to style as well as in stamens, forms a closer link between *Endespermum* and *Miscolobium* generally than do the remaining groups. At the same time the fact that Haviland records the stamens of *D. bornëensis* as sometimes isodiadelphous helps to link the group, and therefore the section *Miscolobium* as a whole, with *Dalbergaria*.

51. DALBERGIA VELUTINA Benth. var. TYPICA Prain Journ. As. Soc. Beng. **lxvi.** 2, 117 (1897); **lxx.** 2, 43 (1901).

D. velutina Benth. Pl. Jungh. i. 255 (1851); Journ. Linn. Soc. iv. Suppl. 43 (1860); Bak. in Hook. f. Flor. Brit. Ind. ii. 233 (1876); Kurz. Journ. As. Soc. Beng. **xlv.** 2, 281 (1876); For. Flor. Burm. i. 348 (1877).

D. stipulata Wall. Cat. 5868 (1832).

Cassia timorensis Hook. f. & Thorns. Herb. Ind. Or., in part.

A large climber, with densely rusty-pubescent branches. *Leaves* 6—8 in. long; leaflets 13—17, oblong, obtuse or subacute, membranous, dark-green, above puberulous to glabrescent, beneath pale rusty-velvety, distal not much if at all exceeding the others, 15—2 in. long, *6—[#]8 in. wide; rachis 5—6 in. long, densely pale rusty-velvety as are the petiolules, '1 in. long; stipules long-persistent, large obovate- or ovate- to linear-lanceolate, pale rusty-velvety, [#]6 in. long, '1—*25 in. wide. *Flowers* in rather dense axillary panicles with corymbose branches, 4 in. long, 2*5 in. wide, the peduncles, branches and short pedicels densely pale rusty-velvety, bracts at base of pedicels rather large, ovate, velvety; *calyx* campanulate, with two ovate-acute bracteoles embracing lower third of tube, densely pubescent, externally somewhat gibbous at base, upper teeth obtuse, subconnate, the others acute, the lateral rather shorter than the lanceolate lowest, which is as long as the tube; *corolla* white or with pinkish spots, petals all rather long-clawed,

standard with orbicular, slightly emarginate, somewhat reflexed limb; *stamens* 9 or 10, in one sheath split along upper and sometimes partially separated along lower side, filaments free in their upper fourth, alternately shorter and longer; *ovary* glabrous except the rather long, sparsely pubescent stipe; style long, subulate, stigma minute; *ovules* 2—3. *Pod* indehiscent, shortly stipitate, thin, obtuse or subacute, brownish, 1—2-seeded, 2—3 in. long, '6—⁹7 in. wide.

INDO-CHINA: Assam; Silhet, *de Silva* \ Booker *fy Thomson* I Burma; Pegu, Bookee Hill, *Eurz* 1758! Rangoon, *Kurz* ! Tenasserim; Moulmein, *Wallich* \ *Falconer*] Amherst, *Brandis* ! Tenasserim, *Heifer*! MALAYA: Malacca, *Maingay*, 548!

51/2. DALBERGIA VELUTINA Benth. var. MAINGAYI Prain Journ. As. Soc. Beng. lxxvi. 2, 117 (1897); lxx. 2, 44 (1901).

A large climber or a rambling shrub with closely, shortly rusty-puberulous branches. *Leaves* as in the type, but glaucescent to glaucous, rusty-puberulous beneath, glabrous or very sparsely puberulous above; rachis dark rusty-puberulous as are the petiolules; stipules long, persistent, rather smaller than in type, and very closely, shortly dark-velvety. *Flowers* as in type, but *calyx* dark-rusty, very shortly and closely puberulous; *corolla* white.

INDO-CHINA: Tenasserim, *Heifer* I Tavoy, *Shaik Muqim* ! Mergui, *Griffith*, 1798 I MALAYA: Malacca, *Maingay*, 612! Singapore, *Ridley*, 5923! 6080 ! Borneo, *Haviland*, 1444!

Only unripe pods of the type have been seen by the writer; no fruits have been seen of VAR. *Maingayi*, which differs from the other chiefly in the character and amount of the pubescence, and which in Tenasserim appears to pass insensibly into the type.

PLATE 55. *Dalbergia velutina* Benth. VAU. *typica*.—1, Flowering branch, from a Rangoon specimen, *n. s.*; 2, flower X 2; 3, pedicel with basal and epicalycine bracteoles X 4; 4, calyx, laid open X 4; 5, standard X 4; 6, wings X 4; 7, keel-petals X 4; 8, stamens X 4; 9, ovary X 4; 10, ovary, laid open X 4; 11, ovule X 10; 12, pod from a Moulmein specimen, not quite ripe, *n. s.*

PLATE 56. *Dalbergia velutina* Benth. VAR. *Maingayi* Prain.—1, Flowering branch, from a Singapore specimen, *n. s.*; 2, single flower; 3, pedicel with basal and epicalycine bracteoles X 4; 4, calyx, laid open X 4; 5, standard X 4; 6, wings X 4; 7, keel-petals X 4; 8, stamens X 4; 9, ovary X 4; 10, ovary, laid open X 4; 11, ovule X 10.

52, DALBERGIA BORNEENSIS Prain Journ. As. Soc. Beng, lxx. 2, 44 (1901).

A large climber, with quite glabrous angular branches. *Leaves* 3 — 5 in. long; leaflets 7—9[^] oblong, obtuse, mucronulate, membranous, quite glabrous on both surfaces, somewhat glaucescent beneath, 1 in. long, '5 in. wide, the terminal more cuneate at base and slightly larger than the rest; rachis 3 in. long and petiolules *1 in. long, glabrous; stipules large, ovate or ovate-lanceolate, glabrous or sparingly puberulous, subpersistent, '2 in. long. *Flowers* in lax lateral panicles with few corymbose branches, 2*5 in. long, 1-5 in. wide; the peduncles angled, glabrous, the branches and pedicels glabrous or very sparingly adpressed rusty-puberulous; bracts ovate with narrow bases, glabrous, bracteoles at base of

pedicels and the pair under calyx narrowly subulate, adpressed rusty-puberulous; *calyx* campanulate, base slightly gibbous, externally adpressed rusty-puberulous; teeth acute, in length subequal, the upper pair wider than the three lanceolate lowest; *corolla* white, petals with claws all as long as calyx-tube, standard orbicular-oblong, emarginate, somewhat reflexed; *stamens* 10, rarely 9, in one bundle split along upper side; *ovary* long-stipitate, glabrous except the puberulous stipe; style subulate, stigma minute; *ovule* usually solitary. *Pod* thinly leathery, pale straw-coloured, finely uniformly reticulated throughout, 1-seeded, 2'25 in. long, '75 in. wide; *seed* markedly reniform, *5 in. long, '2 in. wide.

MALAYA: Borneo; near Kuching, *Haviland* 2S89! Kalong, *Haviland* 2890! *

Very nearly allied to *D. vclutina* VAR, *Mainyayi*, but with a different calyx and standard and very different epicalyoine bracteoles, and easily distinguished by its fewer, smaller, mucronulate, quite glabrous leaflets.

PLATE 57. *Dalbergia bornëensis* Prain.—1, Flowering; branch, from near Kuching, *n. s.*; 2, bud X 4; 3, pedicel and epicalycine bracteoles X 4; 4, calyx, laid open X 4; 5, standard X 4; 6, wings X 4; 7, keel-petals x 4; 8, stamens X 4; 9, ovary X 4; 10, ovary, laid open X 4; 11, ovule X 10; 12, fruits, from a Kuching specimen, *n. s.*; 13, fruit, one valve removed, showing seed *in situ n. s.*; 14, seed, *n. s.*

% 16. **Ovatae.**—*Epicalycine bracteoLs obtuse, shorter than calyx; leaflets large; style slender, cylindrical; trees.*

A natural group, two of the members of which have been treated, though not perhaps very conveniently, as varieties of one species by Baker. The position of the two other species is not absolutely certain, but they are most probably members of this group.

53. DALBERGIA OBTUSIFOLIA Prain Journ. As. Soc. Beng. Ixx. 2, 42 (1901).

D. ovata var. *obtusifolia* Bak. in Hook, f. Flor. Brit. Ind. ii. 231 (1876).

D. glauca Kurz Journ, As. Soc. Beng. xlv. 2, 280 (1876); For. Flor. Barm. i. 343 (1877) not of Wall.

A tree, 40—50 ft. high, with many spreading branches; young shoots pendulous, sub-bifarious, glabrous. *Leaves* 8—12 in. long; leaflets usually 5, occasionally 7, obovate or elliptic rarely the lowest orbicular, retuse or obtuse without or with a mucro, very rarely with a short cuspidate tip, subcoriaceous, bright green above, paler and often glaucous beneath, the distal rather the largest, 2—5 in. long, 2—3 in. wide, rachis 4—5 in. long; petiolnles '2 in. long; stipules caducous. *Flowers* shortly pedicelled, in lax terminal and axillary panicles, 6—8 [in. long, 5—6 in. wide; peduncles and pedicels at first sparsely pubescent; *calyx* campanulate, with 2 basal bracteoles less than half the length of the tube, 5-toothed, the teeth all obtuse and shorter than the tube; *corolla* yellowish-white, petals rather long-clawed except the oblong, shortly clawed, slightly emarginate standard; *stamens* 9, in one bundle, sheath split along the upper side, the filaments free in their upper third, alternately slightly shorter and longer; *ovary* glabrous, long-stipitate; style elongate, stigma small; *ovules* usually 3. *Pod* distinctly stipitate, 1—2-, very rarely 3-seeded, markedly veined opposite the seeds, firmly coriaceous, glabrous, 2—2'5 in. long, #45 in. wide; *seed* much compressed, reniform, smooth but hardly shining, brown, '4 in. long, '25 in.; wide, '15 in. thick.

INDO-CHINA: Pegu; *Kurz* 1784! 2607 partly! Pak-choung, *Brandis* Shan Plateau; Madoe, *Abdul Khalitt* near Fort Stedman, *Abdul Iluq* Taping Valley; near Momien, *J. Anderson*! Hukung Valley; *Griffith* 1809! Chindwin Valley; Katiah mils, *Prazer* Lower Chindwin, *Smythies*

This species is nearly related to *D. ovata* Grab., but differs in having larger, obtuse leaflets with flowers not much more than half the size; the calyx-teeth too are all obtuse, and the basal bracteoles are much smaller: the fruits of the two are not distinguishable. *Kurz* gives the name *Madama* both for this and for *D. ovata*; for this Sir D. Brandis quotes the name *Madama bin*; Mr. Smythies, however, states that the name it bears in the Northern Burmese Forest Circle is *Padouk po*. Mr. Baker has treated this tree as only a variety of *D. ovata*; Mr. *Kurz* has, however, as the writer believes, rightly considered it a distinct species. The name used by *Kurz* is *D. glauca*, and he has employed that name under the impression that Wallich's *D. glauca* is this species. As a matter of fact, however, Wallich's *D. glauca* (Cat. n. 5862 from Moulmein) is identical with Wallich's own n. 5854 (from Martaban) which is the type of *D. cvita* Grah.; Mr. Baker's varietal name has therefore been adopted in a specific sense.

PLATE 58. *Dalbergia obtusifolia* Prain.—1, Branch with leaf and flowers, from the Shan Plateau, *n. s.*; 2, calyx with bracteoles X 4; 3, calyx, laid open X 4; 4, standard X 4; 5, wings X 4; 6, keel-petals X 4; 7, stamens X 4; 8, ovary X 4; 9, ovary, laid open X 4; 10, ovule X 8; 11, fruiting spray, *n. s.*; 12, pod, opened, showing seed *in situ*, *n. s.*; 13, seed, *n. s.*

54. DALBERGIA GLOMERIFLORA *Kurz* Journ. As. Soc. Beng. xlii. 2, 70 (1873); *Bak.* in *Hook. f. Flor. Brit. Ind.* ii. 236 (1876); *Kurz* For. Flor. Burm. i. 345 (1877); *Prain* Journ. As. Soc. Beng. lxx. 2, 50.

A tree, 30—40 feet high; young shoots densely tawny-tomentose. *Leaves* when young very densely tawny-tomentose; leaflets 7—9, ovate or obovate, acute, base rounded or cuneate, coriaceous, bright-green above, rather paler beneath, glabrous when old above, sparingly pubescent beneath, 2—2*5 in. long, 1*25—2 in. wide; petiolules short pubescent, stipules large, ovate-obtuse, herbaceous, glabrous. *Flowers* small, very shortly pedicelled or sessile, densely crowded in small congested panicles at the ends of young villous shoots in the axils of fallen leaves; *calyx* campanulate, partly enclosed in two deciduous herbaceous epicalycine bracteoles glabrous except their margins, one-third as long as calyx; teeth subequal subacute except the lowest, which is acute longer and narrower than the rest, all shorter than the tube; *corolla* white, petals rather long-clawed except the oblong shortly clawed slightly emarginate standard; *stamens* 10, in one bundle, the sheath split along the upper side, but the vexillary filament sometimes almost free from the rest, and partially divided along the lower side, the filaments all free in their upper third and alternately shorter and larger; *ovary* rather long-stipitate, glabrous except the stipe; *stylo* slender; *ovules* usually 4-5, occasionally fewer.

INDO-CHINA: Burma; Prome, *Kurz* 2611!

This species is only known from a single gathering by *Kurz* in the Prome district of Pegu, in 1871. It has been stated by its author to have the stamens united in two separate short sheaths; a careful examination of many flowers shows, however, that this is not always the case; indeed, it has not been met with by the writer in any instance. The character is, as a matter of fact, a very unreliable one in many species, and except for this character, which is not even usual in this tree, there is nothing to suggest its affinity with any other species of the *Dalbergaria* Section. Its nearest ally is not

is clearly *Dalbergia otata*, of which it may even prove ultimately to be only a form. The differentiating characters are the smaller size of the flowers, the much more densely tomentose young shoots, and the greater number (7—9) of its leaflets. The structure of the flower is exactly that of *D. ovata*, except that the lowest oalyx-lobe is here acute, in *D. ovata* it is obtuse.

PLATE 6B. *Dalbergia glomeriflora* Kurz.—1, Young shoot with young leaves and with fully developed flowers, *n. s.*; 2, loose leaflets gathered by Kurz under the same tree, *n. s.*; 3, pedicel with epicalycine bracteoles X 4; 4, calyx, laid open X 4; 5, standard X 4; 6, wings X 4; 7, keel-petals X 4; 8, stamens X 4; 9, ovary X 4; 10, ovary, laid open X 4; II, ovule X 10.

55. DALBERGIA OVATA Grah. in Wall. Cat 5854 (1832); Benth. PI. Jungh. i. 25i (1851); Journ. Linn. Soc. iv. Suppl. 40 (1860); Bak. in Hook. f. Flor. Brit. ii. 231 (1876); Kurz Journ. As. Soc. Beng. xlv. 2, 280 (1876); For. Flor. Burra. i. 343 (1877) Prain Journ. As. Soc. Bang. lxx. 2, 43 (1901).

£>. *glauca* Wall. Cat. 5862 (1832); Benth. PI. Jungh i. 254 (1851).

A tree, 25—35 feet high, with many spreading branches; young shoots pendulous, glabrous. *Leaves* 6—9 in. long; leaflets usually 7, occasionally 5—6, rarely 4, ovate-acuminate, subcoriaceous, bright-green above, paler and at times glaucescent beneath, glabrous, the distal rather larger than the rest, 2—4 in. long, 1—1½ in. wide, rachis 4—5 in. long; petiolules ½ in. long; stipules caducous. *Flowers* shortly pedicelled, in lax terminal and axillary panicles 6—8 in. long, 5—6 in. wide, peduncles and pedicels at first puberulous; *calyx* campanulate, partly enclosed by two deciduous, puberulous, herbaceous bracteoles more than half as long as the calyx, 5-toothed, glabrous except on the margins of the teeth, the teeth subacute subequal except the lowest which is obtuse, longer and wider than the rest, all shorter than the tube; *corolla* yellowish-white, petals rather long-clawed except the oblong shortly clawed, slightly emarginate standard; *stamens* 9, in one bundle, the sheath split along upper side, the filaments free in their upper third, alternately slightly shorter and longer; *ovary* glabrous, rather long-stipitate; style elongate, slender, stigma small; *ovules* usually 3, sometimes 4—5, occasionally 1. *Pod* distinctly stipitate, 1—2, very rarely 3-seeded, markedly veined opposite the seeds, firmly coriaceous, glabrous, 2—3 in. long*, ½ in. wide; *seed* much compressed, reniform, smooth but hardly shining, brown, ¼ in. long, *25 in. wide, #15 in. thick.

INDO-CHINA: Pegu; Rangoon, *Cleghorn* Pegu, Kurz 1785! 2595! 2607 partly! 2610! Tenasserim; Moulmein, *Wallich* 5862! *Falconer* 566! *Parish* 24.01 *Beddome I* Martaban, *Wallich* 5854! Yainway, *Brandis* 1185! Thoungyne, 3,000 ft., *Lobbl* Tavoy, *Shaik Muqim* \ Cambodia; between Saigon and Bienhoa, *Lefèvre* 320!

Though only doubtfully spoken of as a tree by Bentham. and though stated by Baker to be a climber, this is described by Beddome as a large tree, and by Parish as a middle-sized tree. Parish gives the name at Moulmein as *Thit-hsonk-yo* or 'Chisel-handle wood/ its timber * being good for that purpose.' Kurz gives the name *Madama* in Pegu, both for this and for *D. obtusifolia*; Shaik Muqim, who says it is a tree 30 feet high, gives the name as *Kan-ma* at Tavoy.

The bracteoles are like those of *I. latifolia* and *D. emarginata*, but are not so delicate in texture; they are moreover not quite so large and are less caducous. Kurz has proposed, without any particular necessity, a variety *ft. puberula*.

PLATE 59. *Dalbergia ovata* Grah.—1, Branch with leaves and flowers, from Pegu, *n. s.*; 2, calyx with bracteoles X 4; 3, standard X 4; 4, wings X 4; 5, keel-petals X 4; 6, stamens X 4; 7, ovaries, one entire, one laid open X 4; 8, ovule X 10; 9, fruiting spray, *n. s.*; 10, pod, opened to show seed *in situ*, *n. s.*; 11, seed, *n. a.*

56. DAIBERGIA CAMBODIANA Pierre ex Brenier in Bull. Econ. Ind. Chin. v. 75; v. 404 (1902).

A fine tree, 120 feet high, stem 2*5—4 feet thick; wood red, hard, alternately banded with light and dark shades; young branches blackish or dark-brown, lenticelled. *Leaves* 5—7 in. long; leaflets usually 5, occasionally 4, rarely 3, subopposite, ovate, narrowed somewhat abruptly to a shortly widely acuminate obtuse and mucronate tip, base rounded, quite glabrous on both surfaces, closely finely reticulated, rather dark-green above, paler beneath, the terminal often much exceeding the others, 3*5—4 in. long, 25 in. wide, the others 2—25 in. long, 1*25—2 in. wide; rachis 1*75—2.5 in. long and petiolules *15 in. long, glabrous; stipules deciduous. *Flowers* in lax subterminal panicles 3—5 in. long, 1'5—3 in. wide; peduncles surrounded at the base by a few ovate, subcoriaceous bud-scales; branches of panicle few, short, glabrous as are the very short pedicels '06 in. long; bracts and bracteoles not seen; *calyx* campanulate; teeth all obtuse, the two upper subconnate; *corolla* and *stamens* not seen. *Pod* thinly coriaceous, subligulate, glabrous, long-stipitate, 2 in. long, '35 in wide, 1—2-seeded, faintly reticulated opposite the seeds; *seed* rather narrowly ovate, compressed, *25 in. long, #15 in. wide, *05 in. thick; testa black.

INDO-CHINA: Cambodia; Kamput prov.; Camchay Mts., 1,600 feet, *Tierre* 1709!

This is an exceeding distinct species, but the material being incomplete its precise affinity cannot be positively stated. The facies of the specimens recalls *D. ovata*, though the leaflets are somewhat differently shaped and more resemble those of *D. glomeriflora*, a species of which so far only the flowers are known. The pods of *D. cambodiana* are very different from those of the other species here referred to the *Ovatae* whereof the fruits are known, and are more like those of *D. cochinchinensis* and *D. gmoides* which are typical members of the group *Latifoliae*, but the seeds differ very considerably. The *Ovatae* and the *Latifoliae* are, however, very closely related and might without much inconvenience be treated as constituting a single group; it is almost certain that *D. cambodiana*, when its flowers are known, will be found to belong to one or other of the groups; till the epicalycine bracteoles are seen it will not, however, be possible to say with certainty to which, of the two it should be referred; the probabilities seem in favour of the *Ovatae*. The seeds are of a shape unusual in the genus *Dalbergia*.

The Kmer vernacular name is given as *Cra hnung* by Pierre; Breiner gives it as *Tra hnung*. The wood of this tree was formerly reserved in Cambodia for the needs of the king; it was at one time abundant in the western provinces of Cambodia, but is now rather scarce.

PLATE 60. *Dalbergia cambodiana* Pierre.—1, Branch in fruit from the Camchay Mts., Kamput, Cambodia, *n. s.*; 2, fruit, laid open, showing seed, *n. s.*; 3, seed, *n. s.*

57. DALBERGIA TONKINENSIS Prain Journ. As. Soc. Beng. lxx. 2, 42 (1901).
Dalbergia sp. Drake del Castillo Journ. de Bot. v. 215 (1891).

A small or medium tree, *leaves* 8—8'5 in. long; leaflets 9—11, ovate, base rounded, apex shortly abruptly acuminate, firmly aubcoriaceous, sparsely puberulous when young,

soon glabrous, 2*5—3'5 in. long, 16̄—2 in. wide; rachis 5—6 in. long, and petiolules 12 in. long, glabrous; stipules small, tawny-puberulous, deciduous. *Flowers* white, fragrant, in small corymbose axillary panicles 2 in. long, 1*5 in. wide. *Pod* firmly coriaceous, ovate or oblong, subacute, distinctly stipitate, 2 in. long when 1-seeded, 3 in. long when 2-seeded, '75 in. wide, very distinctly reticulated opposite the seeds; *seed* reniform, compressed, #35 in. long, *2 in. wide.

CHINA: Hainan; *B. C. Henry*] TONGKING: Hanoi; *Balansa* 2184!

The material of this species available is insufficient for complete description, but is sufficient to show that we have here to do with a quite distinct form. Mr. Drake del Castillo has suggested that it is a *Sissoa*; the point can only be settled when flowers are available for examination.

PLATE 61. *Dalbergia tonkinensis* *Prain*.—1, Twig in young leaf, from Hainan, *n. s.*; 2, leaf from a Tongking specimen (*Balansa* 2184) in Herb. Berol. *n. s.*; 3, spray of pods, from a Tongking specimen (*Balansa* 2184) in Herb. DCv, *n. s.*; 4, single pod, laid open to show seed *in situ*, *n. s.*; 5, seed, *n. s.*

¶ 17. *Latifolia*—*Epicalycine* bracteoles obtuse, as long as the calyx; leaflets large; style slender, cylindrical; trees.

A very natural group of forms; indeed, it is doubtful whether the first two are more than varieties of one species. Most nearly related to the *Ovatae*, the *Latifoliae* deviate from these, and approach the group *Smoo* among *Polio pet a? a*, in having very large epicalycine bracteoles.

58. DALBERGIA LATIFOLIA Roxb. Corom. PL ii. 7 t. 113 (1798); Hort. Beng. 53 (1814); DC. Prodr. ii. 416 (1825); Flor. Ind. iii. 221 (1832); Wall. Cat. 5852 (1832); W. & A. Prodr. i. 261 (1834); Grab. Cat. Bomb. Pl. 55 (1839); Voigt Hort. Suburb. Calcutt. 240 (1845); Wight. Ic. t. 1156 (1850); iienth. PL Jungh. i. 254 (1851); Journ. Linn. Soc. iv. Suppl. 38 (1860); Dalz. & Gibs. Bomb. Flor. 77 (1861); Bedd. Flor. Sylvat. t. 24, excl. main fig. (1869); Brand. For. Flor. 148 (1874); Bak. in Hook. f. Flor. Brit. Ind. ii. 231 (1876); Kurz. Journ. As. Soc. Beng. xlv. 2, 280 (1876); For. Flor. Burm. L 342 (1877); Talbot Bomb. List 74 (1894); Gamble Dirjeel. List 29 (1896); Woodr. Journ. Nat. Hist. Soc. Bomb. xi. 426 (1897); Prain Journ. As. Soc. Beng. lxx. 2, 41 (1901); Kanjilal Flor. Sci. Circ. 129 (1901); Cooke Flor. Pres. Bomb. i. 396 (1902); Prain Bengal Plants i. 411 (1903).

D. emarginata Roxb. Hort. Beng. 53 (1814); Flor. Ind. iii. 221 (1832); Wall. Cat. 5858 (1832); Voigt Hort. Suburb. Calcutt. 241 (1845).

D. Eydiana Roxb. MSS. ex Benth. in Miq. PL Jungh. i. 254 (1851).

A tree, 30—70 feet high, with rather smooth bark; stem fairly straight, reaching 4 feet in diam. at 5 feet from the ground, with numerous spreading branches; young shoots pendulous, sub-bifarious, glabrous. *Leaves* 6—9 in. long; leaflets 3—7, usually 5, but often 3-4, seldom 6-7, suborbicular, obtuse or emarginate very rarely subacute or acute, glabrous on both surfaces, green above, pale eubglaucescent beneath, the distal usually rather the largest, 1.75—2.5 in. long, 1.25—2*5 in. wide; rachis 4—6 in. long, petiolules 2 in. long. *Flowers* distinctly pedicelled,

in lateral corymbose panicles, visually in the axils of fallen' leaves, rarely one terminal; pedicels *15—*2 in. long; *calyx* campanulate, slightly puberulous when young and enclosed by two large very caducous membranous bracteoles; 5-toothed, the two upper teeth subconnate, the lateral pair obtuse resembling the obtuse lower, all rather shorter than the tube; *corolla* white, petals all distinctly clawed, standard-limb suborbicular; *itaments* 9, in one sheath split along upper side, the filaments free in their upper third, indistinctly shorter and longer; *ovary* glabrous, rather long-stipitate; style slender, stigma small; *ovules* usually 5, sometimes as few as 3 or as many as 7. *Pod* indehiscent, distinctly stipitate, 1—3-seeded, sparingly but distinctly-veined opposite the seed, 2—3*25 in. long, ^m7 in. wide, firmly coriaceous, abruptly rounded to both style and stipe; *seed* much compressed, reniform, brown, smooth but hardly shining, ^f4 in. long, ⁻25 in. wide, [#]15 in. thick.

HIIMALAYA: Submontane forests of Nepal, *Maries*! Sikkim Terai, *Booker*! *Gamble*! EAJPUTANA: *Abu*, *King* \ Merwara, *Brandt's* I N. INDIA: Parasneth, *Anderson*] Tandi Forests, *Campbell* \ Hundiugagh, *Brain* I Palamau, *Gamble* 8845! Singbhum, *Ilaines* 213! Orissa, *Lace* I C. INDIA: Chanel a; *Burkill*; Chattisgarh; *Bhrldll*. S. INDIA: Ayamalais, near Coimbatour, *Wijhtl* Nilgiris, *Wight* \ *Lcschnaull* 246! *Gamble* 14374! W. INDIA: Kala Nadi, *Ritchie* 230! Concan, *Stocks*! Mercara, *Metzl* Ahmadabad; Coa, *Burkill* INDO-CHINA: Andamans, *Kyd*. MALAYA: Peninsula, Jurong, *Ridley*, 8444!

Cultivated examples: MADRAS: *Ucynel* LOWER BENGAL: *Wallichl Thomson* \ *Eurz* \

The writer finds usually 5, rarely 4 ovules in ovaries of this species; Beddome, however, records 7; Bentham records 3: tho flowers are faintly fragrant. Ritchie gives the vernacular name as *Shhliam*; Kanjilal says *Wilayati khūham*, in Dehra Dun, where it is only planted; Leschanault gives *Isoujpou*, *Futtou*,

PLATE (J2. *Dalbergia lalifolia* *Rozb.-l.*, Flowering branch, specimen from Mt. Abu, Rajputana, *n.s.*; 2, flower bud X 4; 3, the same, bracteoles removed X 4; 4, calyx, laid open X 4; 5, standard X 4; 6, wings X 4; 7, keel-petals X 4; 8, stamens X 4; 9, ovaries, one entire, one laid open X 4; 10, ovule, greatly enlarged; 11, twig with fruits, epocimen from Nepal, *n. s.*; 12, seed, *n. s.*

59. DALBERGIA SISSOIDKS Grah. in Wall. Cat. 5876 (1832); W. & A. Prodr. i. 265 (1834); Benth. PL Jungh. i. 254 (1851); Journ. Linn. Soc. iv, Suppl. 39 (1860); Bedd. Trans. Linn. Soc. xxv. 216 (1865).

D. javanica Miq. Flor. Ind. Bat. i. 1, 132 (1855); Benth. Journ. Linn. Soc. iv. Suppl. 38 (1860).

D. latifolia Koord. & Val. Bijdr. ii. 77 (1895), hardly of Roxb.

D. latifolia VAR. *sissoides* Bedd. Flor. Sylvat. sub t. 24 (1869); Bak. in Hook. f. Flor. Brit. Ind. ii. 231 (1876).

D. emarginata Prain Journ. As. Soc. Beng. lxx. 2, 41 (1901), hardly of Roxb.

An erect tree, 40—70 feet high, with rather smooth bark and straight stem with numerous spreading branches; young shoots pendulous, sub-biforous, glabrous. *Leaves* 6—9 in. long; leaflets usually 7—8, rarely 5—6, obovato subacute, very rarely sub-orbicular obtuse; glabrous on both surfaces, green above, glaucescent beneath, the distal usually the largest, 1-25—2 in. long, 1—1-75 in. wide, rachis 4-6 in. long, petiolules

•25 in. long. *Flowers* distinctly p^adicelled, in large terminal panicles with or without a few lateral in the axils of upper leaves of the same season; pedicels *15—2 in. long; *calyx* campanulate, when young slightly puberulous and enclosed in two large very caducous membranous bracteoles; 5-toothed, the two upper teeth subconnate, the three lower subequal, oblong, obtuse or subacute, as long as the tube; *corolla* white, petals all distinctly clawed, standard-limb entire with wavy margin; *stamens* 9 or less often 10, in one bundle split along upper side; filaments free in their upper third, alternately somewhat shorter and longer; *ovary* glabrous, rather long-stipitate; style slender, stigma small; *ovules* usually 4. *Pod* indehiscent, 1—3-, rarely 4-seeded, very distinctly veined opposite the seeds, 2—3'z in. long, '5 in. wide, firmly coriaceous, gradually cuneate towards both style and stipe; *seed* much compressed, reniform, pale-brown, smooth but hardly shining, *35 in. long, *2 in. wide.

MALABARIA: Travancore, 200 feet elev., *Burddlon* 535! Nilgiris, at Segur, *Clarke* 11,"05! *Wight*: 931! Pulneys; at Kodaikanal Ghat, *Bourne* 139 R! MALAYA: Java; Madioen, KeJiri, etc., *Ileijer*! *Ilorsfitli*! *Koorders*!

This species is very nearly related to *D. latifolia*, and may indeed be only a form of that tree; the distinctions, however, seem constant so far as India is concerned, and the woodcutters of Southern India are said to distinguish the two by their habit and their timber, and to give them different names. The two trees do not, as Gamble suggests (*Manual of Indian Timbers*, Ed. 2^d 252), differ greatly as regards floral structure; the chief difference is as regards the position of the inflorescence. Both this and *D. latifolia* are reported from the Nilgiris, but these hills appear to be the northernmost limit of *D. sissoides*, and in the Pulneys, where Dr. A. G. Bourne has kindly looked into the matter at the writer's request, only one species or variety of Blackwood is to be found, for all Dr. Bourne's specimens are referable to *B. sissoides*, none to *D. latifolia*. From Travancore too only *D. sissoides* has been sent to Calcutta, though both trees are stated to occur there. The Java tree, which is certainly *D. javanica* Miq., has been referred by Koorders and Valet on, extremely careful observers who know the tree in the living state, to *D. latifolia*. The Java specimens, as a matter of fact, do not appear to the writer to agree exactly either with *D. latifolia* of Northern India or with *D. sissoides* of Southern India, but of the two they seem by their leaves and pods to agree better with *D. sissoides* than with the form to which Koorders and Valet on have referred it. Perhaps the Southern India and the Java trees are different geographical forms of the more widespread *D. latifolia*.

The Andaman form of *D. latifolia* by its inflorescence, and the Malay Peninsula form of the same trees by its leaves seem both to approach the Java form, though as regards its pods the Malay Peninsula tree is quite like the Northern Indian one and is unlike the Javanese tree. In consequence of this similarity on the part of the Andaman tree, as shown by a manuscript drawing by Roxburgh, and of the Java tree, the writer suggested two years ago that the name *D. emarginata* be adopted for the species. The fact was, however, overlooked that Bentham has recorded his having met with a specimen of Roxburgh's *D. emarginata*, named by Roxburgh himself *D. Kydiana*, from the Andamans, and that this specimen belongs to *D. latifolia*: this record is decisive, hence the present change. Bentham does not state in what Herbarium he saw this specimen; the writer has not succeeded in tracing it.

PLATE 63. *Dalbergia sissoides* Grah.—1, Flowering branch; specimen from Segur, Nilgiris, *n. s.*; 2, fruiting branch; specimen from Kodaikanal, Pulneys, *n. s.*; 3, bud, enclosed in bracteoles X 4; 4, calyx, laid open X 4; 5, standard X 4; 6, wings X 4; 7, keel petals X 4; 8, stamens X 4; 9, ovary X 4; 10, ovary, laid open X 4; 11, ovule X 8; 12, pod from Pulney specimen, *n. s.*; 13, immature seed from the same X 6; 14, pod, from Java specimen, *n. s.*; 15, ripe seed from the same, *n. s.*

60. DALBERGIA COCHINCHINENSIS Pierre ex Laness. PI. Util. Col. Frang. 289 (1888); Brenier in Bull. Econ. Ind. Chin. v. 75; v. 402 (1902).

A tree, 80 feet high, stem 2—2*5 feet thick; wood dark-red taking on an ebony tint with age; bark grey, smooth, fibrous; young branches grey, much lenticelled. *Leaves* 6—8 in. long; leaflets 7—9, subopposite, ovate-acute, or shortly acuminate with an obtuse tip, base wide-cuneate, quite glabrous on both surfaces, pale-green above, glaucescent beneath, closely finely reticulated, 1*25—2*5 in. long, *75—1 in. wide; rachis 4—7 in. long, and petiolules '2 in. long quite glabrous; stipules ovate, very deciduous. *Flowers* in lax axillary panicles 3*5—6 in. long, 2—3 in. wide, the peduncles surrounded at the base by a few ovate membranous bud scales; branches few, very faintly puberulous as are the pedicels '12 in* long; bracts and epicalycine bracteoles ovate, membranous, •1 in. long, very caducous; *calyx* campanulate, thinly coriaceous, glabrous, -]5 in. long, the three lower teeth ovate-acute, the lowest rather longer than the lateral but hardly exceeding the two ovate-obtuse almost completely connate upper teeth; *corolla* white, standard ovate-oblong, slightly reflexeJ, with rounded slightly involute apex and wide-cuneate base tapering to the broad, short, stout claw; wings long-clawed with a large spongy thickened patch inside at upper edge of base of blade; keel-petals connate above, markedly auricled below, long-clawed; *stamens* 9, in one sheath split above, or 10, the tenth free on one side ami r.eorly free on the other; filaments free in their upper third, alternately shorter and longer; *ovary* long-stipitate, quite glabrous; style very slender, stigma minute; *ovules* 3. *Pod* subligulate, thinly coriaceous, quite glabrous, 2—3 in. long, ⁴4—^f5 in. wide, 1—2-seeded, hardly reticulated opposite the seeds; *seed* reniform, compressed, '25 in. long, '2 in. wide, #07 in. thick; testa greyish-brown.

IXDO-CHINA: Cochin-China; Bencat, on the Saigon river (fr.), *Ple?re* Baiia, at the base of Mt. Dinh (fl.), *Pierre I* Phu-Quoc, Cam Chay, also forests between the Dong-Nai and the Bin-Thuan, *Lanessan*.

This is Herb. Pierre 1710 and is a very fine and distinct species, nearest of the Asiatic *Dalbergia* to *D. hirtifolia* and *D. sissoides*; at one time plentiful it is now becoming rare owing to indiscriminate felling. The native names given in Herb. Pierre are Anam, *Trdc*; Kmer, *Cra hnung*; the second name, it will be observed is also applied to *D. cambodiana*.

Both Lanessan and Brenier give the vernacular name as *Trdc*; Brenier adds, however, that six trees are known by this vernacular term. These are *Trdc den* (or Black Trác), *Trdc rang* (or Yellow Trác), *Trdc bong* (or Spotted Trác), *Trdc trang* (or White Trác) and *Trdc mat* (or Buff Trác). There is nothing in H. Brenier's remarks on these forms to indicate whether the names cited connote different species, or only different forms of one species, or in any way to assist in their botanical identification.

PLATE 64. *Dalbergia cochinchinensis* Pierre.—1, Twig, with leaves and flowers, specimens from base of Mt. Dinh, Baria, *n. s.*; 2, young bud X 8; 3, bud X 4; 4, calyx, laid open X 4; 5, standard X 4; 6, wing-petals X 4; 7, keel-petals X 4; 8, stamens X 4; 9, ovary x 4; 10, ovary, laid open X 4; 11, ovule X 8; 12, 13, pods from a specimen from Bencat, on the Saigon river, *n. s.*; 14, seed, *n. s.*

% 18. **Polyadelpa**.—*Pod* oblong-lanceolate, samaroid; leaflets rather small; epicalyce bracteoles acute, shorter than the calyx; style slender, conical; a tree.

This group seems best referred, on general grounds, to *Mucoluhium*; the single species of which it is composed bears a considerable general resemblance to various American species of this section. The peculiar arrangement of the stamens, which recalls what is met with in the genus *Pterocarpus*, shows, however, that the group serves as a link between the sections *Mis:olobium*, where the stamens are normally monadelphous, and *Dalbergaria*, where they are normally isodiadelphous.

61. DALBERGIA POLYADELPHA Prain sp. nov.

A small to medium tree, 15—30 feet high. *Leaves* 4—8 in. long; leaflets usually 9, sometimes 7, occasionally 11—12, ovate-lanceolate, base cuneate or in the proximal sometimes rounded, apex gradually narrowed to the obtuse slightly mucronate tip, chaitaceous, dark-green and glabrous except the puberulous midrib above, glaucescent and finely sparsely adpressed-puberulous beneath, the distal the largest, 1½ in. long, ⅝ in. wide, rarely ⅞ in. long, 1 in. wide, gradually diminishing to the proximal ⅙ in. long ⅜ in. wide; rachis 8—4 in. long, and petiolules ⅓ in. long, finely puberulous; stipules ovate-lanceolate, pubescent, very caducous. *Flowers* in rather dense thyrsoid axillary or infra axillary panicles, 2½ in. long, 2 in. wide; peduncle stout, glabrous; branches short, rusty-pubescent; slender pedicels ½ in. long, very sparingly pubescent; bracts small, ovate, deciduous; epicalycine bracteoles deciduous, sparingly pubescent, ovate-lanceolate; *calyx* campanulate, tube externally glabrous below sparsely puberulous above, ½ in. long; teeth unequal, lowest lanceolate as long as tube and longer than the subequal acute lateral and the ovate subconnate upper pairs; *corolla* distinctly lineate, standard wide ovate, emarginate, the cuneate base passing into the short broad stout claw; wing-petals oblong, sagittate on upper side, long-clawed; keel-petals long-clawed united above, blades hastate on upper side below; *stamens* 10, connate at the base in a very short sheath, split on upper side, the filaments rather irregularly separated downwards from one-third to nine-tenths of their length so as to become irregularly and incompletely 3—5-adelphous; *ovary* glabrous except the long pubescent stipe; style subulate-conical, stigma minute; *ovules* 3—4. *Pod* oblong, coriaceous, glabrous except the short but distinct stipe, cuneate less often rounded at base, acute or acuminate at the apex, 2½—3½ in. long, 1 in. wide, strongly reticulated opposite the 1—2 seeds; *seed* subreniform-oblong, much compressed, ⅜ in. long, ¼ in. wide, ⅓ in. thick; testa black, shining.

CHINA: Yunnan; Szemao, forests at 5,000 feet elev., *Henry* 11688! 12454! 12502!

A very distinct species, the precise localisation of which is rather difficult; the leaves and pods recall certain American *Miscolobium* more than they do any of our Asiatic *Dalbergia**; the calyx and corolla are however equally suitable for the sections *Miscolobium* and *Dalbergaria* and at first sight the fact that the staminal sheath is divided would suggest *Dalbergaria*, where the normal arrangement of stamens is an isodiadelphous one, as the most suitable place for this tree. The careful examination of many flowers shows, however, that no matter how deeply divided the stamens in *B. polyadelpa* may be, and no matter how many groups they are arranged in, the filaments are always monadelphous at the base, not quite divided into two bundles as in a normal *Dalbergaria*. This fact, combined with the likeness of the species to several undoubted *Miscolobium* from other regions, renders it advisable to treat *D. polyadelpa* also as a *Miscolobium*,

PLATE 65. *Dalbergia polyadelpa* Prain.—1, Flowering branch from Szemao, S. W. Yunnan (*Henry* 11088), n. s.; 2, bud X 4; 3, pedicel with epicalycine bracteoles X 4;

calyx, laid open X 4; 5, standard X 4; 6, wings X 4; 7, keel-petals X 4; 8, stamens X 4; 9, ovary X 4; 10, ovary, laid open, X 4; 11, ovule X 12; 12, fruiting branch, from Szemao, S. W. Yunnan (*Hen?* 12502), *n. s.*; 13, pod, opened, showing seed *in situ*, *n. s.*; 14, seed, *n. s.*

§ 5. **DALBERGARIA.**—Standard ieflexed, but not distinctly refracted, the claw tapering gradually into the blade; stamens normally isodiadelphous.

This section includes the American and African *Ecistaphylla*, which also have isodiadelphous stamens. It is most nearly related to the section *Miscolum*, and only differs from that section 08 regards stamens. The character is not absolutely constant; in the group *Reiviformes*, for example, the species *D. reniformis*, though usually isodiadelphous, is sometimes monadelphous—at all events in young flowers; in *D. Kunstleri* both arrangements seem about equally common. In the section *Sençfae*, while *D. sericea* seems always to have isodiadelphous stamens, *D. sacerdotum*, which in every other respect is clearly very closely related to *D. sericea*, has them monadelphous; in *D. sacerdotum*, however, the flowers examined were all very young, which possibly explains the condition observed.

¶ 1[^]. **Sericea** G.—Pod very narrow-ligulate, swiroid; style cylindrical; leaflets obtuse; trees.

Apparently a very natural group, including the two most exclusively northern Asiatic forms. Other species do occur where *D. sericea* grows, but except itself and *D. Sissoo* all of them naturally extend much further south, either to Indo-China, or to Peninsular India, or both.

62. DALBERGIA SERICEA G. Don Gen. Syst. ii. 375 (1832); Prain Journ. As. Soc. Beng. lxx. 2, 51 (1901); Bengal Plants i. 410.
- D. robusta* Wall. Cat. 5849 A (1832), not of Roxb.
- D. hirdna* Wall. Cat. 5871 B (1832); Benth. PL Jungh. i. 25G (1851); Journ. Linn. Soc. iv. Suppl. 4G (1860); Brandis For. Flor. 101 (1874); Bak. in Hook. f. Flor. Brit. Ind. ii. 230 (1870); Gamble Darjeel. List 29 (1890); Prain Journ. As. Soc. Beng. lxxvi. 2, 449 (1897); Kanjilai Flor. Sch. Circ. 130 (1901), not of Ham.
- V. assamica* Benth. Journ. Linn. Soc. iv. Suppl. 45 partly—the Subsiwalik plant (1860); Bak. in Hook. f. Flor. Brit. Ind. ii. 235 partly (1870).
- D. stenocarpa* Kurz Journ. As. Soc. Beng. xliv. 2, 205 (1875); Bak. in Hook. f. Flor. Brit. Ind. ii. 238 (1876); Gamble Darjeel. List 29 (1878).
- D. emarginata* Royle ex Prain Journ. As. Soc. Beng. lxx. 2, 51 (1901), not of Roxb.

A considerable tree; young shoots sub-bifarious, silky-tomentose. Leaves 8—10 in. long; leaflets 13—21, sometimes 21, rarely 9—11, ovate slightly retuse, base rounded or cuneate, 1—1.75 in. long, .75—1 in. wide, chaitaceous, medium-green and very sparsely adpressed-pubescent above, glaucescent and rather closely pubescent beneath, distal leaflet hardly exceeding the rest; rachis 7—9.5 in. long, silky-pubescent as are the petiolules .15 in. long; stipules subfalcate-lanceolate, silky-pubescent, caducous. Flowers in short rather dense axillary panicles, 1—2 in. long, .5—1.75 in. wide, the peduncles, branches and pedicels densely silky-pubescent; bracteoles lanceolate, obtuse, silky pubescent; calyx campanulate, densely pubescent; teeth obtuse shorter than the

except the lowest lanceolate as long as the tube; *corolla* white, petals all rather long-clawed, standard suborbicular, emarginate; *stamens* 10, in 2 lateral bundles of 5 each; *ovary* shortly stipitate, pubescent; style slender, stigma small capitate; *ovules* usually 4—5, *Pod* indehiscentj tapering below to the rather rhort stipe, apex acute, flat, brownish, coriaceous, narrowly ligulate, 1—5-seeded, glabrous, 1—2 in. long, *25—%4 in, wide, reticulated opposite the seeds; *seed* reniform, compressed, *2 in. long, -1 in. wide, testa dull, brownish.

HIMALAYA: Dehra Dun; *Wallichl Roylel Shimála, Inaijatl Mackinnonl Garhwal, Kirg! Duthie! Kamaon; Strachey if Winterbottom! T. Thomson \ King !* below Betwari, 5,000 ft. *Duthie \ Ganges Valley, 3,000— 4,000 ft., Duthie ! Nepal, Wallichl Sikkim ; Garidcora, Clarke ! Choonbuttea, Clarke ! Mungpoo, Gammk ! Mahanadi, Gamble ! Pankabari, Gamble] Ryang, Lister] Prain I Sivoke, Gamble] Tista Valley, 3,000— 4,000 ft., Prainl Bootan; Griffith] Kalimpong, 4,000 ft., Gamble] Alipur Duars; Mahakalguri, Ileaivood !*

PLATE 66. *Dalbergia sericea* G. Don.—1, Flowering branch, from Kumaon, *n. s.* ; 2, bud X 4 ; 3, epicalycine bracteioes X 4 ; 4, calyx, laid open X 4 ; 5, standard X 4 ; (3, wings X 4 ; 7, keel-petals X 4 ; 8, stamens X 4 ; 9, ovary X 4 ; 10, ovary, laid open X 4 ; 11, ovule X 16 ; 12, twig with fruiting panicle, from Sikkim, *n. s.* ; 13, pod, *n. s.* ; 14, pod, opened, showing young seed, *n. s.* ; 15, seed X X.

63. DALBERGIA SACERDOTUM Prain Journ. As. Soc. Beng, Ixx. 2, 42 (1901).

A tree; the young twigs soft, blackish, faintly pubemlous, *leaves* 8 in. long; leaflets 9—11, ovate, base cuneate, apex obtuse notched, membranous, finely reticulated, sparsely adpressed-puberulous on both surfaces, 2*5 in. long, 1*25 in. wide, the rachis 6 in. long, finely pubemlous; petiolules '15 in. long, pubemlous; stipules spatulate-lanceolate, puberulous. *Flowers* in terminal thyrsoid panicles 3 in. long, 2*5 in. wide, the peduncle, branches and slender pedicels rusty-puberulous; bracteoles lanceolate obtuse, membranous, deciduous; *calyx* campanulate, 5-toothed; teeth all obtuse, the two upper somewhat connate, the lowest longer than the others; *petals* all short-clawed, standard orbicular faintly thickened at base; *stamens* 10, monadelphous, immature; *ovary* bhortly stipitate, stipe hairy, elsewhere glabrous ; *ovules* 4. *Pod* narrowly ligulate, thinly coriaceous, tapering to the stipitate base, apex acute; glabrous, 3-seeded, 2*5 in. long., '35 in. wide.

CHINA: Shanghai, *Hélot & d'Argy 75!*

The flowers are young and the stamens are monadelphous; this, however, does not preclude the possibility of their being diadelphous at a later stage. Except for the monadelphous condition of the etaminal sheath, all the characters of *D. sacerdotum* indicate a close affinity with *D. sericea* G. Don, next to which the writer would suggest that the species should stand. If the character of monadelphoua stamens be held to outweigh every other consideration, then the species mnst be placed near *D. Sissoo*. The reverend Collectors give as its Chinese name *Te-Za* or " Aloes-wood."

PLATE 67. *Dalbergia sacerdotam* Prain.—1, Branch from Shanghai, in Herb. Paris, *n. s.* ; 2, calyx, laid open X 4 ; 3, standard X 4 ; 4, wings X 4 ; 5, keel-petals x 4 ; 6, stamens x 4 ; T, ovary X 4 ; 8, the same, laid open x 4 ; 9, ovule X 10 ; 10, pod, *n. s.*

^ [20. Lanceolarieae.—*Pod uide-ligida'e to ovate-lanceolate, samaroid ; style slender ^ cylindric ; leaflets obtuse; trees.*

A very natural group. The species that deviates most from the others and stands apart as a subgroup by itself is *I*, *paniculata*, which has a different stem-structure, with alternating layers of wood and bast, and has the stamens differently inserted inside the calyx-tube. The remaining species exhibit a steady and gradual transition from one to the other.

64. DALBERGIA PANICULATA Eoxb. Corom. PL ii. 8, t. 114 (1798); Hort. Beng. 53 (1814); DC. Prodr. ii. 417 (1825); Spreng. Syst. ill. 193 (1826); Koxb. Flor. Ind. iii. 227 (1832); Wall. Cat. 5848 partly (1832); W. & A. Prodr. i. 265 partly (1834); Grah. Cat. Bomb. Pl. 55 (1839); Benth. Pl. Jungh. i. 256 (1851); Journ. Linn. Soc. iv. Suppl. 45 (1860); Dalz. & Gibs. Bomb. Flor. 78 (1861); Bedd. Flor. Sylvat. t. 88 (1869); Brandis For. Flor. 151 (1874); Bak. in Hook. f. Flor. Brit. Ind. ii. 236 (1876); Talbot Bomb. List 75 (1894); Woodr. Journ. Nat. Hist. Soc. Bomb. xi. 426 (1897); Prain Journ. As. Soc. Beng. lxxvi. 2, 449 (1897), lxx. 2, 51 (1901); Cooke Flor. Pres. Bomb. i. 399 (1902); Prain Bengal Plants ii. 1273 (1903).

D. nigrescens Kurz Pegu Rep. App. A. 48 and B. 45 (1875); Journ. As. Soc. Beng. xly. 2, 279 (1876); For. Flor. Burro, i. 346 (1877).

D. anomala Pierre MSS. in Herb. Pierre.

A tree, 40—70 feet high; branchlets sub-bifarious, tawny-pubescent, turning black, as do the leaves, in drying. *Leaves* 4—6 in. long; leaflets 9—13, oblong or elliptic, base rounded or truncate, apex obtuse, notched, subcoriaceous, finely reticulated, at first sparsely pubescent, both surfaces soon glabrous above and nearly so beneath, 8—1 in. long, 6 in. wide, very rarely much larger (2 in. long and 1½ in. wide); rachis 3¼—5 in. long, petiolules 15 in. long, puberulous; stipules lanceolate, pubescent, caducous. *Flowers* in dense rusty- or tawny-tomentose terminal panicles extending into the axils of the uppermost leaves, 2—6 in. long, 1½—3 in. wide; bracteoles ovate, pubescent, deciduous; *calyx* campanulate, purplish; teeth acute, subequal except the lowest slightly the longest externally densely pubescent; *petals* white, rather long-clawed; standard oblong, subcuneate at base; *stamens* 10, in two lateral bundles of 5 each with occasionally only the upper side completely divided, inserted half way up the calyx-tube; *ovary* shortly stipitate, pubescent; style slender, stigma capitate; *ovules* usually 3. *Pod* narrow-oblong, rarely in Burmese examples ovate-oblong, tapering to both ends, very rigidly coriaceous, black, indurated and hardly reticulated opposite the seeds, 1—2-seeded, 2—2½ in. long, 75—1/25 in. wide; *seed* reniform, compressed, 3 in. long, 2 in. wide, testa brown, shining.

INDIA: Malabar; Concan, *Gibson I* Travancore, *Latson I* Coromandel; Mysore, *Ileynel G. Thomson* Cuddapah, *Naidoo I* Gambhir Circars, *Roxburgh* Orissa, *Lace I* INDO-CHINA: Burma; Pegu, *Eyre* Upper Burma, at Ngah Kyoun, *J. Anderson* Toladawa, *Abdul Haq* Kyaukse, *Abdul Iluq I* Mardalay, *Abdul Iluq* Ava, *Griffith* Kyaukmyoung, *Abdul Iluq I* Shan Hills, *Abdul Iluq* Cambodia; Togninh, in Cay Cong, along the Saigon River, *Pierre* 136! Bknhua, along the Cai River, also Pdn Lovir, *Pierre* 1041!

In proposing the name *D. nigresiens* Kurz has noted that this tree also occurs in India, the Indian specimens to which he refers being named by himself and being *D. paniculata*. That he did not refer this tree to *D. paniculata* was because he followed Wight and Arnott in their identification, the greater part of their *D. paniculata*, as numerous specimens at Kew and at Calcutta show, being *D. lanceolarii*. As a consequence Kurz's *D. paniculata* from Burma is a tree which he supposed to be the same as Wight's *D. paniculata*, subsequently well characterised by Gamble as *D. o liver i*, which is much more nearly related to *D. lanceolaria* than the present one. Gamble, however, states (*Manual of Indian Timbers*) that, as regards stem-structure, *D. paniculata* and *D. nigrescens* differ considerably, and it may ultimately prove necessary to distinguish the Indian from the Indo-Chinese tree included under the present species. If this be done, the Indo-Chinese one must be known as *D. nigrescens*. But if they do differ essentially in stem-structure, the fact remains that they are identical as regards leaves, flowers and fruits, and that both 'dry black'—a circumstance that does not occur in the case of any other Asiatic *Dalbergia* except the tree here described as *D. paniculata* var. *saigonensis*. In Orissa L'nce finds that this species is known as *Bahuldia*. The Cambodian tree for which Pierre has suggested the apposite name *D. anomala* is precisely Kurz's *D. nigrescens*; the Anamite vernacular name is *Xe'in qudf*, the Kmer name is *Xnoi'L*.

VAR. *saigonensis* var. nov. (*D. saigonensis* Pierre MSS.) A tree, 50—70 feet high, stem nodose or verrucose, bark grey. *Leaves* 5 in. long; leaflets 8—11, all rather narrowly oblong, obtuse or retuse, 1*5 in. long, '65 in. wide. *Pod* rather narrowly subligulate, 1*75—2*5 in. long, *4 in. wide, 1—3-seeded; *seed* reniform, compressed, .3 in. long, '2 in. wide, testa quite black, shining.

INDO-CHINA: Cambodia; Saigon, at Thiiduc, *Pierre* 222 !

Except in having usually rather fewer, and always decidedly narrower leaflets; in having always narrower pods; and in having black in place of brown seeds, this tree does not differ from *D. paniculata*: it 'dries black' in precisely the same fashion. In India, and especially in Central Indo-China, the pods of *D. paniculata* are often much broader than usual; not infrequently these broad pods occur on the same branch with pods of the usual size. The pods of VAR. *saigonensis* do not depart more from the normal in one direction than do the broad pods referred to in another. The combination, however, of an unusual shape of leaflet with a different colour of testa renders it advisable to distinguish the present tree at least as a variety: it may indeed ultimately prove necessary to recognise in *D. paniculata*, as here understood, three distinct species:—!), *panindata* Roxb., Indian only; *D. nigrescens* Kms, throughout Central and Eastern Indo-China; and *D. saigonensis* Pierre, in Eastern Indo-China only.

PLATE 68. *Dalbergia paniculata* Eoxb.—1, Flowering branch from the Concan, *n. s.*; 2, bud X 4; 3, calyx, laid open X 4; 4, standard X 4; 5, wings X 4; *G*₇ keel-petals X 4; 7, stamens, usual arrangement X 4; 8, stamens, occasional arrangement X 4; 9, ovary X 4; 10, ovary, laid open X 4; 11, ovule X 10; 12, fruiting twig from Cuddapflh; 13, fruits of large-leafed form from Kyoukmyoung, *n. s.*; 14, seed, *n. s.*

PLATE 69. *Dalbergia paniculata* Roxb. VAR. *saigonensis* Prain.—1, Fruiting branch from Thu'dric, Saigon, *n. s.*; 2, pod, opened, showing seed *in situ*, *n. s.*; 3, another pod, with 3 seeds, seen from one edge, *n. s.*; 4, seed, *n. s.*

C5. DALBERGIA HUPEANA Hance Journ. Bot. xx. 5 (1882); Forbes & Hemsl. Journ. Linn. Soc. xxiii. 198 (1887); Harms in Engl. Bot. Jahrb. xxix. 416 (1900); Prain Journ. As. Soc. lieng. Ixx. 2, 53 (1901).

A tree, 20—30 feet high, with numerous spreading branches; branchlets sub-bifarious, glabrous. *Leaves* 8—10 in. long; leaflets 9—11, oblong-elliptic, obtuse or retuse, firmly

chartaceous, closely reticulately veined, 1*75—2*5 in. long, 1—1.5 in. wide, glabrous above, puberulous but ultimately glabrescent beneath; rachis 6—7 in. long, and petiolules '2 in. long, glabrous; stipules caducous. *Flowers* in lax terminal panicles often extending into the axils of the uppermost leaves, 3—8 in. long, 2*5—6 in. wide, peduncles and branches glabrous, pedicels sparsely rusty-pubescent; basal and epicalycine bracteoles ovate, pubescent, deciduous; *calyx* campanulate; lower tooth lanceolate, as long as tube and twice as long as lateral subacute; upper pair rather larger than lateral obtuse, subconnate; *corolla* white, petals all rather long-clawed, standard orbicular, emarginate; *stamens* 10, in two lateral bundles of 5 each, filaments free in their upper third; *ovary* shortly stipitate, glabrous except the stipe and base; style filiform, stigma capitate; *ovules* usually 2—3. *Pod* indehiscent, oblong or broadly ligulate, rather firmly coriaceous, apex acute, base tapering to the distinct stipe, 2—3 in. long, '5 in. wide, faintly veined opposite the 1—2, rarely 3 seeds, glabrous; *seed* reniform, compressed, '3 in. long, '2 in. wide.

CHINA: Szechuen; *Farges* Hupeh; Ichang, *Walters*! *Henry*! *Faber*! Chtkiang; Ning-po, *Oldham*! *Cooper*! *Faber*! Kwangtung; *Sampson*! *Ford*! *Carles*! Nant'ou, *Carles*!

Tan-moa-chou, the tree; *Tchan-keou*, the wood (*Farges*): *Paitan*, the local; white *Ckandan*, the classical name (*Cooper*): the *Tan* tree [*Henry*]. In *Herb. Kew*, *Henry* notes that the flowers of the *Tan* are white and yellow with some lilac markings inside one of the petals. They are slightly fragrant. The wood is used for the hammers of oil-presses and for the handles of tools such as planes and hammers; in this it resembles *D. ovata*, *D. Oliveri* and 2). *latifolia*.

PLATE 70. *Dalbergia hupeana* Hance.—1, Flowering branch from Hupeh, *n. s.*; 2, bud X 4; 3, pedicel with epicalycine bracteoles X 4; 4, calyx, laid open X 4; 5, standard X 4; 6, wings X 4; 7, keel-petals X 4; 8, stamens X 4; 9, ovary X 4; 10, ovary, laid open X 4; 11, ovule X 10; 12, branch in young fruit, from Hupeh, *n. s.*; 13, twig with ripe fruit, from Hupeh, *n. s.*; 14, pod opened, showing seed *in situ*, *n. s.*; 15, seed, *n. s.*

66. DALBERGIA ASSAMICA Benth. *PI. Jungh.* i. 255 (1851); *Journ. Linn. Soc.* iv, Suppl. 45—Assam plant only (1860); *Bak.* in *Hook. f. Flor. Brit. Ind.* ii. 235—Assam plant only (1876); *Prain Journ. As. Soc. Beng.* lxvi. 2, 449 (1897); lxx. 2, 52 (1901).

D. lanceolaria Gamble *Darjeel. List* 29 (1896), not of *Linn. f.*

A tree, with numerous spreading branches; branchlets sub-bifarious, glabrous. *Leaves* 10—12 in. long; leaflets 13—21, oblong-elliptic, obtuse or retuse, chartaceous, 1*5—2 in. long, #75—1*25 in. wide, sparsely adpressed-puberulous but soon glabrous above, subpersistently adpressed-pubescent beneath, closely finely reticulate-veined; rachis 8—10 in. long, and petiolules '2 in. long, at first puberulous, soon glabrescent; stipules ovate-lanceolate, foliaceous, deciduous. *Flowers* in short lax axillary panicles, 4—6 in. long, 3 in. wide, peduncles glabrous, branches and pedicels finely sparsely puberulous; basal and epicalycine bracteoles ovate, deciduous; *calyx* campanulate, with a lanceolate lower tooth as long as tube and twice as long as the triangular acute others, the two upper subconnate and slightly reflexed; *corolla* white, petals all rather long-clawed, standard orbicular, emarginate; *stamens* 10, in two lateral bundles of 5 each, filaments all free in

their upper third; *ovary* stipitate, sparingly hirsute; style slender, stigma small capitate; *ovules* usually 4. *Pod* indehiscent, oblong or broadly ligulate, thinly coriaceous, apex acute, base tapering to the distinct stipe, 2—3 in. long, *5 in. broad, faintly veined opposite the 1—2, sometimes 3, very rarely 4 seeds, glabrous; *seed* reniform, compressed, •25 in. long, #2 in. wide.

HIMALAYA: Sikkim; submontane forests at Choklong, *Gamble* Bootan; submontane forests in the Narchu Valley, *Prain* \ INDO-CFTJNA: Assam; Brahmaputra Valley, at Sibsagar and elsewhere, *Griffith* ! *Jenkins* ! *Masters* ! *Hooker* *Sf Thomson* ! *Peal* \ Mongsemdi, *Wattl* CHINA: Yunnan; Szemao Mts., 4,500 feet elev., *Henry* 12988!

In Assam this tree is known, according to Peal, as *Medeloa*; its timber is much esteemed.

PLATE 71. *Dalbergia assamica* *JScnth.*—1, Flowering branch from Sibsagar, Assam, *n. s.*; 2, bud X 4; 3, pedicel with basil and epicalycine bracteoles X 4; 4, calyx, laid open X 4; 5, standard X 4; 6, wings X 4; 7, keel-petals X 4; 8, stamens X 4; 9, ovary X 4; 10, ovary, laid open X 4; 11, ovule X 10; 12, twig, in fruit, from Sibsagar, Assam, *n. s.*; 13, pod, opened to show young seed *in situ*, *n. s.*; 14, seed, *n. s.*

67. DALBERGIA BALANSAE *Prain* Journ. As. Soc. Bcng. Ixx. 2, 54 (1901).

D. lanceolaria Forbes & HemsL Journ. Linn. Soc. xxiii. 193 (1887); Drake del Castillo Journ. de Bot. v. 214 (1891), not of Linn. f.

A tree, 20—30 feet high; young branches sub-bifarious. *Leaves* 5—7 in. long; leaflets 13—15, ovate-oblong, obtuse or retuse, persistently puberulous beneath, chartaceous, finely reticulately veined, 1*25 —1.5 in. long, .75—85 in. wide, rachis 4—6 in. and petioles '15 in. long, puberulous; stipules lanceolate. *Flowers* in lax axillary panicles 3—4 in. long, 2 in. wide, with glabrescent or puberulous peduncles and puberulous branches and slender pedicels; basal bracteoles ovate-lanceolate, epicalycine bracteoles lanceolate-obtuse, very caducous; *calyx* campanulate; the upper teeth subconnate subacute, lateral acute half as long as tube, lowest lanceolate as long as tube; *corolla* white, petals all rather long-clawed, standard orbicular 2-callose at base, slightly emarginate; *stamens* 10, in two lateral bundles of 5 each, filaments free in their upper fourth alternately shorter and longer; *ovary* stipitate, densely pubescent; style short conical, stigma minute; *ovules* 1—5, usually 3. *Pod* indehiscent, long-stipitate, tapering to both ends, usually 1-, rarely 2—3-seeded, firmly coriaceous, reticulated opposite the seeds, 3—5 in. long, 1 in. wide; *seed* subreniform, compressed; only seen immature.

CHINA: Kiangsi; Kiu-Kiang, *Shearer* \ Kwangtung; *Sampson* *Ford* *I Millett* INDO-CHINA; Tongking; Mt. Bavi, *Balansa* !

Ford says this may be a small shrub or pass into a tree 20 feet high.

PLATE 72. *Dalbergia Balansae* *Prain.* — 1, Flowering branch from Tongking, *n. s.*; 2, calyx, laid open X 4; 3, standard X 4; 4, wings x 4; 5, keel-petals x 4; 6, stamens X 4; 7, ovary X 4; 8, ovary, 1-ovuled, laid open X 4; 9, ovary, 5-ovuled, from the same specimen, laid open X 4; 10, ovules X 6; 11, ovule X 10; 12, fruiting twig from Kwangtung, *n. s.*; 13, fruit, opened to show young seeds *in situ* *n. s.*; 14, young seed, *n. s.*

08. DALBERGIA MINAHASSAB Koorcl. Meded. 's lands Plantent. xix. 430, 630 (1898).

Dalbergia sp. Vidal PL Vase. Filip. 112 'm part (1886).

D. ferruginea Prain Journ. As. Soc. Beng. lxx. 2, 55 (as to Vidal 2598, 2606 only) (1901).

D. lanccolaria? Llanos Mem. Acad. Cienc. Madr. (1858); App, ad Flor. Philip. Blanco Ed, iii. iv. 103 (1880) possibly.

A tree with spreading branches; branchlets puberulous, sub-bifarious. *Leaves* 8—11 in. long; leaflets 15—25, ovate-oblong, obtuse or emarginate, base cuneate and slightly unequal, 1*25—1*75 in. long, #65—#75 in. wide, firmly papery, sparsely adpressed-strigose on both surfaces; rachis 6*5—9*5 in. long, minutely puberulous, as are the petiolules *15 in. long; stipules lanceolate, subfalcate, deciduous. *Flowers* in axillary panicles 3—4 in. long, 1*5—2 in. wide, peduncles branches and pedicels puberulous; bracts minute, basal bracteoles ovate-acute small, epicalycine oblong-obtuse, all pubescent; *calyx* campanulate, externally pubescent; lowest tooth lanceolate about as long as the tube, the others subequal obtuse, the upper pair subconnate; *corolla* white, petals all distinctly clawed, standard orbicular, emarginate; *stamens* 10, in two lateral bundles of 6 each that are often not quite discrete, filaments free in their upper third, alternately shorter and longer; *ovary* densely pubescent, distinctly stipitate; style slender, stigma minute; *ovules* 4. *Pod* not seen.

PHILIPPINES; Morong, *Tidal*! Panay, *Tidal*! ? Angat, *Llanos*. EASTERN MALAYA: Celebes; Minahassa, *Koordcrs*!

In the Philippines this is known as *Ualubanit*; in Celebes it is *Tapoehmdang*. It is possible that this is *D. lanccolaria?* Llanos, which is stated to have a linear silky pod, a character that effectually disposes of Llanos' own suggestion. The pod of *D. Minahassae* is as yet unknown, but the species has a densely velvety ovary and is thus *capable* of having a silky pod.

PLATE 73. *Dalbergia Minahassae* *Koord*,—1, Flowering twig from Minahassa, Celebes, *n. s.*; 2, end of a twig from Panay, Philippines, *n. s.*; 3, bud X 4; 4, pedicel with epicalycine bracteoles X 4; 5, calyx, laid open X 4; 6, standard X 4; 7, wings X 4; 8, keel-petals X 4; 9, stamens X 4; 10, free portion of filaments and anthers X 10; 11, ovary X 4; 12, ovary, laid open X 4; 13, ovule X 10.

69. DALBERGIA SZEMAOENSIS Prain sp. nov,

A tree, 20 feet high, with densely tawny-velvety young branches. *Leaves* with leaflets 19—21, when young densely velvety-pubescent on both surfaces; rachis and petiolules densely tawny-velvety; stipules large ovate-obtuse, *6 in. long, '25 in. wide. *Flowers* in lax panicles 6 in. long, 8 in. across, below the leaves on young branches that end in leafy shoots; peduncles, branches and pedicels all densely fawny-velvety; main panicle-branches 3 in. long, secondary 1 — 1*25 in. long, pedicels slender '2 in. long, subsecund; bracts ovate, densely tawny, #1 in. long, very deciduous; basal bracteoles wide-ovate and epicalycine pair ovate densely tawny, the latter embracing lower two-thirds of calyx-tube; *calyx* campanulate, tube ghibrescent externally at base, pubescent above; teeth unequal, 4th lowest lanceolate twice as long as acute lateral and obtuse subconnate upper pairs, and rather longer than the tube; *or oil* i purple, standard orbicular,

reflexed, emarginate, somewhat thickened at the junction with the narrow distinct claw; wings wide-ovate, long-clawed, auriculate at base of blade on upper side; keel-petals long-clawed, connate above, auricled at base of blade; *stamens* 10, in two lateral bundles of 5 each; *ovary* stipitate, densely pubescent throughout; style slender conical, stigma small; *ovules* usually 3. *Pod* not seen mature; young pods oblong to suborbicular.

CHINA: Yunnan; Szemao Alts at 5,000 feet elev., Henry 11895!

A species nearly related to *D. lanceolaria*, *D. Oliveri*, *D. Hemzleyi* and their allies, but quite distinct by reason of the very large stipules. The young leaves are densely pubescent, but it does not therefore follow that they are so when adult; not being fully developed, measurements are not given for the leaflets or rachis.

PLATE 74. *Dalbergia szemaoensis* Prain — 1, Flowering shoot from Szemao, *n. s.*; 2, bud with bracteoles X 4; 3, pedicels with bracteoles X 4; 4, calyx, laid open X 4; 5, standard x 4; 6, wings X 4; 7, keel-petals X 4; 8, stamens X 4; 9, ovary X 4; 10, ovary, laid open X 4; II, ovule X 10; 12, immature fruit X 4.

70. DALBERGIA OLIVERI Gamble ex Prain in Journ. As. Soc. Beng. lxvi. 2, 151 (1897); lxx. 2, 53 (1901).

D. purpurea Bak. in Hook. f. Flor. Brit. Ind. ii. 235 partly (1876); Prain Journ. As. Soc. Beng. lxvi. 2, 449 (1897), not of Wall.

D. paniculata Kurz Journ. As. Soc. Beng. xh\ 2, 279 (1876); For. Flor. Burm. i, 345 (1877), not of Roxb.

D. Prazen Prain Journ. As. Soc. Beng. lxvi. 2, 452 (1897); lxx. 2, 53 (1901).

D. laccifera Laness. Pl. Util. Col. Fran<., 289 (1886) possibly.

D. aestivalis Pierre MSS. in Herb. Pierre, possibly.

A tree, 60—80 feet high, with pale flaky bark and a straight stem, 2—3 feet in diam. at 5 feet from the ground; young shoots spreading, sub-bifarious, slightly puberulous, *Leaves* 6—9 in. long, on young shoots sometimes 11 in. long; leaflets 13—17, rarely 9 or 11, on young shoots sometimes 19—21, ovate, subacute or obtuse emarginate, 1/5 in. long, .85 in. wide, glabrous or finely sparsely adpressed-pubescent on both surfaces when young; soon quite glabrous, chartaceous, finely reticulately veined, distal leaflet hardly exceeding the others; rachis 5—7.5 in. long and petiolules #2 in. long, glabrous; stipules lanceolate, glabrous or puberulous. *Flowers* in spurious lateral panicles with glabrous peduncles and sparsely puberulous branches and pedicels; each apparent panicle 3 — 6 in. long, 4—8 in. wide, terminating in a small leafy shoot, which develops before the fruits ripen; bracts at base of pedicels and bracteoles under calyx lanceolate, half as long as calyx-tube, puberulous; *calyx* puberulous or pubescent, campanulate, the two upper teeth subconnate obtuse, the lateral acute, shorter than tube, lowest lanceolate as long as tube; *corolla* white externally, lilac in bud, purple within, petals all long clawed, standard obovate or orbicular emarginate not thickened at base; *stamens* 10, in 2 lateral bundles of 5 each, all filaments free in their upper third, alternately shorter and longer; *ovary* glabrous except the stipe, or slightly pubescent in the lower half, rather long-stipitate; style slender, stigma capitate; *ovules* usually 3. *Pod* indehiscent, long-stipitate, tapering to the base, rounded or acute at apex, coriaceous, glabrous, usually 1-seeded, sometimes 2—3-seeded, reticulated throughout, but indurated and smooth opposite the seeds, 2.25—3.5 in. long, .65* in. wide; *seed* reoiform, somewhat compressed, .45 in. long, .25 in. wide.

INDO-CHINA : Burma; Pegu, *Ku[^]zl* Wuntho, *Oliver*] Bhamo, *Oliver* I Koni, *Frozer* !
Chattiah, *Prazer* ! Siam; *Teysmann* Bienhoa, near Song-lu, *Pierre* 1704!

This *Kurz* terms *Ta-pouk-pen* or *Ta-bouk-ben*; in all Burmese recent collections, however, the name given is *Tamalan*. It has a fine hard red wood used for the handles of instruments in the same way as the woods of *D. cvata* and *D. latifolia* are used. The specimen of *D. oestivalis* *Pierre* examined has no flowers or fruits; as regards leaves it agrees very well with the present species: the native names are noted as *Chlieu-lai Bon-darn* (Moi) and *Cay cam hi* (Anam). The native name cited by *Lanessan* for his *D. laccifera* leads to a suspicion that it also is the same.

PLATE 75. *Dalbergia Oliveri Gamble*.—1, Flowering branch, pseudo-panicle, ending in a leafy branch, from Wuntho, *n. s.*; 2, leafy branch, fully developed, from Wuntho, *n. s.*; 3, bud, showing basal and one epicalycine bracteole X 4; 4, calyx, laid open X 4; 5, standard X 4; 6, wings X 4; 7, keel-petals X 4; 8, stamens X 4; 9, ovary X 4; 10, ovary, laid open X 4; 11, ovule X 8; 12, fruiting branch, from Chattiah, *n. s.*; 13, seed, *n. s.*

71. DALBERGIA LANCEOLARIA Linn. f. *Suppl.* PI, 316 (17&1); *DO.* *Prodr.* ii. 417(1825); *Benth.* *Journ. Linn. Soc.* iv. *Suppl.* 45 (1860); *Dalz. & Gibs.* *Bomb. Flor.* 78 (1861); *Brandis For. Flor.* 151 (1874); *Bak.* in *Hook. f. Flor. Brit. Ind.* ii. 235 (1876); *Trim. Ceyl. Flor.* ii. 88 (1894); *Talbot Bomb. List,* 74 (1894); *Woodr. Journ. Nat. Hist. Soc. Bomb.* xi. 426 (1897); *Prain Journ. As. Soc. Beng.* lxx. 2, 52 (1901); *Kanjilal Flor. Sch. Circ.* 129(1901); *Cooke Flor. Pres. Bomb.* 399 (1902); *Prain Bengal Plants* i. 411 (1903).

D. frondosa *Roxb.* *Hort. Beng.* 53 (1814); *DC. Prodr.* ii. 417 (1825); *Roxb. Flor. Ind.* iii. 226 (1832); *Wall. Cat.* 5855 (1832); *W. & A. Prodr.;* 266 partly (1834); *Grah. PI. Bomb.* 55 (1839); *Wight Ic.* t. 266 (1850); *Voigt. Hort. Suburb. Calcutt.* 241 (1845); *Benth. PI. Jungh.* i. 256 (1851); *Thw. Enum.* 94 (1859); *Bedd. Flor. Sylvat.* t. 88 (1869).

D. zeylanka *Roxb.* *Hort. Beng.* 53 (1814); *Flor. Ind.* iii. 228 (1832); *Wall. Cat.* 5847A (1832); *Voigt Hort. Suburb. Calcutt.* 241 (1845).

D. arborea *Heyne* in *Roth. Nov. Sp.* 330 (1821); *DC. Prodr.* ii. 417 (1825), not of *Willd.*

D. hircina *Ham.* in *Wall. Cat.* 5871A (1832).

D. pankulata *W. & A. Prodr.* i. 265 mainly (1834); *Kanjilal Flor. Sch. Circ.* 130 (1901), not of *Roxb.*

A tree, 40—60 feet high, with rather smooth grey bark and a straight stem, 2—3 feet in. diam. at 5 feet from the ground; young shoots spreading, sub-bifarious, rusty-puberulous or glabrous. *Leaves* 5—7 in. long; leaflets 7—11, less often 13 rarely 15, ovate-oblong, rarely huborbicular, obtuse or retuse, 1*25—1*75, rarely i young shoots 2*5 in. long, (Jo—#8 in. wide, chartaceous, finely reticulately veined, when young usually densely finel^ rnsty-pubescent, when m&tire glabrous or sparingly finely adpressed-j^ubescnt on both simaces cr only beneath, distal leaflet hardly exceeding the others; rachis 3'5—5*5 in. long and petiolules #15 in. long at first pubescent, soon glabrous; stipules subfalcate-lanceolate, on young shoots sometimes '5—75 in. long deciduous. *Flowers* in lax panicles, teiminal and in the axils of young leaves on

new shoots, 2—3 in. long, 2 in. wide, the peduncles, branches and pedicels at first rusty-pubescent; basal bracteoles lanceolate, epicalycine oblong very minute caducous; *calyx* campanulate, the upper teeth subconnate obtuse, the others acute, the lowest as long as the tube, externally pubescent; *corolla* blueish-white, petals all rather long-clawed; standard orbicular, emarginate, thickened at base; *stamens* 10, usually in 2 lateral bundles of 5 each, sometimes the vexillary stamen also free, all filaments free in their upper fourth and alternately shorter and longer; *ovary* pubescent, rather long-stipitate; style slender, stigma capitate; *ovules* usually 3. *Pod* indehiscent, long-stipitate, tapering to both ends, usually 1 — 3-seeded, rarely 4—5-seeded, coriaceous, reticulated opposite the seeds, 2*25—4 in. long, 1/2 in. wide; *seed* reniform, somewhat compressed, 1/4 in. long, 1/25 in. wide.

INDIA: Sub-Himalayan Forests; Hard war, *Hamilton*] Darhora, *Ham'Uon!* Sukhiya, *Hamilton!* Siwaliks, *Iearle!* Rajputana; Abu, *King!* Ajmir, *Jacquemoni!* Coromandel; C. India, *Jerdon!* Behar, *Iloo/cer!* Chota Nagpur, *Gamble!* *Haines!* *Campbell!* *Clay!* *Wood!* *Prain!* Orissa, *Lace!* Mysore, *G. Thomson!* Vellore, *Gamble!* Coromandel, *Hcyne!* *Roxburgh!* Kurnool, *Gamble!* Tellicherry, *Mdz!* *Wight!* Cottulam, *Leschei!* *Shevarois!* *Perrottet!* Malabar; Coucan, *Stocks!* *Law!* Canara, *Tulbot!* *lielgaum!* *Ritchie!* CEYLON; Central Province, *Ihwaitcs!*

L'Gchenault gives as the vernacular name *Toda Cutty Mo rum*; Lice reports that in Orissa it is known as *Any aria*.

PLATE 76. *Dalbergia lanceolaria* Linn. /.—I, Flowering branch from S. India, *n. s.*; 2, twig with part of leaf and stipules, from a root-sucker from Chota Nagpur, *n. s.*; 3, young flower X 4; 4, epicalycine bracteoles X 4; 5, calyx, laid open X 4; 6, standard X 4; 7, wings X 4; 8, keel-petals X 4; 9, stamens X 4; 10, ovary X 4; 11, ovary, laid open X 4; 12, ovule X 10; 13, fruiting branch, from W. India, *n. s.*; 14, pod of unusual size, from a Parasnath specimen, *n. s.*; 15, pod, laid open, showing seed *in situ*, «, *s*; 1C, seed, *n. s.*

72. DALBERGIA HEMSLEYI Prain Journ. As. Soc. Beng. lxvi. 2, 450 (1897); Ixx. 2, 54 (:901).

A tree, 20 feet high, with spreading branches; branchlets silky- (or rusty-pubescent, sub-bifarious), *Leaves* 4—5 in. long; leaflets usually 5, sometimes 7, rarely 9, ovate-lanceolate or ovate or suborbicular, obtuse or narrow-truncate, emarginate, pubescent at length glabrescent above, densely rusty- or silky-pubescent beneath, dull-green on both sides, 1*5—2 in. long, 1/5—1 in. wide, rather firm, finely reticulately veined; rachis 2*5—4 in. long, densely rusty or silky as are the petiolules 1/5 in. long; stipules small, densely pubescent, deciduous. *Flowers* in axillary panicles 4 in. long, 1*5 in. wide, peduncles, branches and pedicels densely persistently rusty- or silky-tomentose; *calyx* campanulate, teeth acute, the lowest slightly exceeding the others, externally densely tomentose; *corolla* with petals rather long-clawed, standard orbicular emarginate, not thickened at the base; *stamens* 10, in two lateral bundles of 5 each, filaments free in their upper third; ovary not seen, stipe of young pods pubescent. *Pod* indehiscent, long-stipitate, tapering to both ends, 1—3-seeded, coriaceous, reticulate throughout, but especially opposite the seeds, 2*25—4 in. long, 1/65 in. wide; *seed* reniform; compressed, 1/45 in. long, 1/25 in. wide.

IXDO-CHINA : Burma ; Shan Hills, at Fort Stedman, *Collett* ! Indine, *Abdul Ehalil* ! Lwekaw, *Abdul Ehalil* ! Myingyin, *Prazer* ! Cambodia; Xpong, on Mt. Pang-Chai, *Pierre* 1042!

PLATE 77. *Dalbergia Hemsleyi Prain*.—1, Specimen in young fruit, from Fort Stedman, *n. s.* ; 2, calyx, laid open X 4 ; 3, standard X 4 ; 4, wings X 4 ; 5, keel-petals X 4 ; G, stamens X 4 ; 7, fruiting branch from Myingyin, *n. s.* ; 8, fruit from Indini[^], laid open, showing seed *in situ*, *?. s.* ; 9, seed, *n. s.*

This species belongs to the same group as *D. lanceolaria*, *D. Oliveri* and *D. Bolanae*, and is apparently the Shan and Cambodian representative of the group. It most resembles *D. lanceolaria*, though it has even fewer leaflets than that species usually has. Its agreement with *D. lanceolaria* is marked chiefly by the fact that the panicles are in the axils of leaves of the same season instead of issuing from below these. It has, moreover, the same dense pubescence that characterises *D. lanceolaria* when the leaves and shoots of that species are young. It differs, however, very markedly in having this pubescence persistent, whereas in *D. lanceolaria* the shoots and leaves beneath soon become nearly or quite glabrous. There is no marked thickening at the base of the standard-blade in this species ; its flowers therefore become practically identical with those of *D. Oliveri* ; nor are its pods and seeds very different from those of that species, which has sometimes pubescent branchlets and leaflets subpersistently pubescent (the form = *D. Prazeri*) beneath. The much more numerous leaflets of *D. Oliveri*, however, and the flowers springing not even from old leaf-axils, but in lateral pseudo-panicles, the main rachis of which ends in a leafy shoot and develops ultimately into a leafy branch, very amply distinguish that species from the present one.

No native name has been recorded from Burma for *D. Hemsleyi*, and it is not impossible that some of the remarks made regarding the wood of *D. Oliveri* are really applicable to this species. The Knier name for this in Cambodia is *Xnoul* ; this name is, however, also used for *D. paniculata*.

[^][21. *Canae*.—*Pod wide-ligulate, samaroid; styh subulate; leaflets acute or subacute; trees.*

A subnatural group. *D. Wattii* differs considerably in facies and in pod from the remaining species and, but for the inadvisability of unduly multiplying our groups, might be made to stand apart. It agrees with the other species as regards style, and it differs from the *Laurolarieae*, with which it has much in common, both as to style and as to shape of leaflets. It thus forms a good connecting link between the *Lrutcolarieae* and the *Canae* rather than a satisfactory member of either group. The remaining species, though sometimes very different in appearance *Li* in size of leaflets and fruits, are in essential characters very closely allied.

73. DALBERGIA WATTII Clarke Journ. Linn. Soc. xxv. 17. t. 5 (1889); Prain Journ. As. Soc. Beng. lxxvi. 2, 451 (189?); lxx. 2, 53 (1901).

A tree, 30 feet high, with spreading, sub-bifarious, glabrous branches. *Leaves* 6—8 in. long ; leaflets 9—11, often subopposite, ovate-lanceolate acute with involute margins, dark-green glabrous above, glaucescent faintly hairy beneath, 2.5—3 in. long, 1 in. wide, membranous, finely reticulate; rachis 3.5—4 in. long, glabrous as are the very short petiolules; stipules ovate-lanceolate, foliaceous, deciduous. *Flowers* in axillary panicles 2 in. long 1.5 in. wide, peduncles, branches and pedicels sparsely pilose ; basal and epicalycine bracteoles ovate-lanceolate, subpersistent, the latter half as long as calyx-tube ; *calyx* campanulate, teeth acute, the two upper subconnate, all except the lanceolate lowest shorter than the tube ; *corolla* white, petals all rather long-clawed, standard orbicular emarginate ; *stamens* 10, in two lateral bundles of 5 each, filaments all

free in their upper third; *ovary* with long pilose stipe, but itself glabrous except along one suture; style very slender, stigma minute; *ovule* usually solitary. *Pod* thinly coriaceous, glabrous, shortly stipitate, 2*25 in. long, '75 in. wide, narrowed to the base, somewhat rounded at apex, veined opposite the solitary seed; *seed* reniform, compressed, '45 in. long, *25 in. wide,

INDO-CHINA: Manipur; Meitaphum, 5,000 ft. *Watt* I Mayung, 3,500 ft. *Clarke*]

PLATE 78. *Dalbergia Wattii Clarke*.—1, Flowering branch from Meitaphum, Manipur, *n. s.*; 2, pedicel with epicalycine bracteoles X 4; 3, calyx, laid open X 4; 4, standard X 4; 5, wings X 4; 6, keel-petals X 4; 7, stamens X 4; 8, ovary X 4; 9, ovary, laid open X 4; 10, ovule X 6; 11, twig in fruit, from Mayung, Manipur, *n. s.*; 12, pod, opened to show seed *in situ*, *n. s.*; 13, seed, *n. s.*

74. DALBERGIA MAMMOSA Pierre MSS. in Herb. Pierre.

A tree, 60 feet high; young branches blackish, glabrous. *Leaves* 6—8 in. long; leaflets 11—15, narrow-oblong, acute, base cuneate, quite glabrous on both sides, pale-green above, glaucescent beneath, rather thinly chartaceous, 1*5—1*75 in. long, *5 in. wide; rachis 5—6 in. long and petiolules #15 in. long glabrous. *Flowers* in axillary panicles 3 in. long, 2 in. wide; rachis and panicle branches very sparingly pubescent; bracts and bracteoles not seen; *calyx* narrowly campanulate; *corolla* and *stamens* not seen. *Pod* wide-ligulate, firmly coriaceous, glabrous, strongly reticulated except opposite the seeds, narrowed to the base, more or less rounded at the apex, 4—6 in. long, -8 in. wide, considerably suberously thickened and umbonate opposite the solitary, rarely 2 seeds; *seed* reniform, compressed, "35 in. long, -25 in. wide, -07 in. thick.

INDO CHINA: Cochin-China; Baria, on Mt. Chóben, *Pierre* 1711 *bis*!

This tree, though not yet completely represented, since flowers are unknown, is undoubtedly a member of the group *Canae* in the section *Dalbergaria*. The leaves alone are sufficiently unlike those of the other allied species to warrant its recognition as distinct; the peculiarly umbonate suberous thickenings of the pod opposite the seeds supply a character that distinguishes it from every other known species of the genus. This species is very nearly related to the next species and bears the same Ananiite name, *Ccbon lai*.

PLATE 79. *Dalbergia mammosa Pierre*.—1, Fruiting branch from Mt. Chóben in Baria, *n. s.*; 2, pod, opened, showing seed *in situ*, *n. s.*; 3, seed, *n. s.*

75. DALBERGIA BARIENSIS Pierre MSS. in Herb. Pierre.

A tree, 50—70 feet high; young branches brown, glabrous. *Leaves* 7—9 in. long; leaflets 15—15, ovate-oblong, abruptly narrowed to a retuse tip, medium-green above, pale-green beneath, firmly chartaceous, quite glabrous on both surfaces, 1*5—1*75 in. long, •75 in. wide; rachis 5—7 in. long and petiolules *2 in. long, glabrous; stipules not seen. *Flowers* in short axillary panicles 1*5 in. long; *calyx* narrowly campanulate; *corolla* not seen; *stamens* not seen. *Pod* wide-ligulate, firraly coriaceous, glabrous, faintly reticulated near the narrowly cuneate base, elsewhere smooth, 5 in. long, 1 in. wide, considerably thickened and suberous, but not umbona'e, opposite the seeds; *seed* solitary, rarely two, reniform, compressed.

INDO-CHINA: Cochin-China; Bienhoa, Baria on Mt. Dinb, *Pierre* 137! near Chóben, *Pierre* 1711 !

Very closely related to *D. mammosa*, but with the pods not umbonate and with leaflets of very different texture and venation and somewhat different shape. As in the case of the preceding species, the Anamite name is *Cám lai*.

PLATE 80. *Dalbergia bariensis* Pierre.—I, Branch with leaves and fruit from Baria, Bienhoa, ?i. s.; 2, pod, laid open, showing seed *in situ*, n. s.; 3, seed, n. s.

76. DALBERGIA DOXGNAIENSIS Pierre MSS. in Herb. Pierre.

D. purpurea? Lances. Pl. Util. Col. Franc.; 289 (1886); Brœnier in Bull. Econ. Ind. Chin. v. 404 (1902) possibly; not *D. purpurca* Wall.

A tree, 50 — 80 feet high; young branches blackish, glabrous. *Leaves* 6—8 in. long; leaflets 9—11, narrowly oblong, acute, base rounded or shortly cuneate, glabrous, even when young, on both surfaces, pale-green, chartaceous, 2 in. long, '75 in. wide; rachis 4—6 in. long and petiolules #2 in. long, glabrous; stipules small, ovate, deciduous. *Flowers* in axillary panicles 4 in. long, 3 in. wide; rachis and branches sparingly pubescent with tawny deciduous hairs; bracts small ovate, epicalycine bracteoles small, lanceolate; *calyx* narrowly campanulate, '25 in. long; lower three teeth lanceolate, the lowest longer than the lateral pair and nearly as long as calyx-tube; upper pair ovate obtuse subconnate; *corolla* violet, standard orbicular reHexed, almost entire, rather short-clawed; wings wide-oblong, long-clawed, hastate at base of blade on upper side as are the long-clawed keel-petals; *stewims* 10, usually in two lateral bundles of 5 each, sometimes the lateral bundles more or less united below; *ovary* long-stipitate, glabrous except the long stoutish stipe; style slender, subconical, stigma capitate; *ovules* usually 2.

INDO-CHINA: Cochin-China; Bienhoa, between Pho-qua and the river Song-cai, Pierre 1705 !

This species has the same vernacular name, *Cám hi*, Anam, as *D. bariensis* and *D. mammosa*. The differently shaped leaflets render it certain that this is not the flowering state of *D. mammosa*; it is not, however, so certain that we may not have in *D. dongnaiensis* the flowering state of *D. bariensis*, for the leaflets of the two are of somewhat similar shape; they are, however, so different in texture and venation that Mr. Pierre is probably right in treating these three forms, known to the people of Anam as *Cám lai*, as distinct species.

PLATE 81. *Dalbergia dongnaiensis* Pierre.—1, Flowering branch from Bienhoa, n. s.; 2, twig with full-grown leaf, from same locality, n. s.; 3, bud X 4; 4, pedicel with epicalycine bracteoles X 4; 5, calyx, laid open X 4; 6, standard X 4; 7, wings X 4; 8, keel-petals X 4; 9, stamens, usual condition X 4; 10, stamens, occasional arrangement X 4; 11, ovary X 4; 12, ovary, laid open X 4; 13, ovule X 8.

77. DALBERGIA DUPERREANA Pierre MSS. in Herb. Pierre.

A tree, 30—60 feet high; young branches blackish, glabrous. *Leaves* 6—10 in. long; leaflets 9—17, narrowly oblong, acute, base cuneate or rounded, medium-green above, paler beneath, firmly chartaceous, 2—2*25 in. long, -65 in. wide; rachis 4—8 in. long and petiolules '2 in. long, glabrous; stipules caducous. *Flowers* in terminal panicles 4 in. long, 3 in. wide, rachis and branches sparingly pubescent; bracts and bracteoles not seen; *calyx* narrowly campanulate, '25 in. long, lower three teeth lanceolate the lowest the longest, upper two teeth ovate subconnate; *corolla* not seen; *stamens* 10, in

two lateral bundles of 5 each; *ovary* not seen. *Pod* widely ovate-lanceolate, firmly coriaceous, glabrous, only faintly reticulated opposite the seeds, long-stipitate, rather abruptly narrowed to the acute apex and the cuneate base, neither umbonate nor suberously thickened, 5 in. long, 1.25 in. wide, 1-seeded; *seed* reniform, compressed, .35 in. long, .25 in. wide, .07 in. thick; testa brown, shining.

INDO-CHINA: Cambodia; Samrong-tong, on lit. Cherrèr, *Pierre* 1039!

This species, though not completely represented, is quite clearly distinct from any hitherto described Asiatic *Dalbergia*. It is obviously another member of group *Canae*, which is so largely developed in Central and Eastern Indo-China; the present species, however, less resembles any of the other Cambodian members of the group than it does the two Burmese species *B. Kurzii* and *D. cana* itself. As regards foliage, *D. Juperrcana* might almost be referred to *D. cana*, but the fruits are very different, being much larger and being, moreover, quite glabrous. The fruits are indeed much more like those of *D. Kurzii*, though they are not quite the same; the foliage is very different from that of *D. Kurzii*. No vernacular name is reported for this species.

PLATE 82. *Dalbergia Duporrana Pierre*.—1, Twig with leaves, from Samrongtong, Cambodia, *n. s.*; 2, part of a fruiting panicle, from same locality, *n. s.*; 3, pod, opened, showing seed *in situ*, *n. s.*; 4, seed, *n. s.*

73. DALBERGIA KURZII Prain Journ. As. Soc. Beng. lxi. 2, 450 (1897); lxx. 2, 50 (1901).

D. purpurea Kurz Journ. As. Soc. Beng. xlw ?, 279 (1875); For. Flor. Burin, i. 344 (1877), not of Wall.

A tree, 40—100 feet high; young branches glabrous. *Leaves* 8—18 in. long; leaflets 7—11, obovate-oblong or rarely oblong, base cuneate rarely slightly rounded, apex obtuse or rarely shortly acuminate, firmly characeous, glabrous above, sparingly puberulous when young, but soon glabrous beneath, 2—5 in. long, .75—2 in. wide; rachis 5—13 in. long, when young slightly puberulous; petiolules .1 in. long, glabrescent; stipules small, obtuse or acute, deciduous. *Flowers* in lax corymbose axillary panicles 4—10 in. long, 3—10 in. wide, peduncles glabrous, branches and pedicels puberulous; bracteoles all lanceolate-acute, puberulous, the epicalycine pair half as long as calyx-tube; *calyx* campanulate, pale-purple, minutely puberulous; teeth triangular, the lowest longer than the rest, all acute, the two upper subconnate; *corolla* white or pale-rose, petals all rather long-clawed; standard orbicular, slightly emarginate; *stamens* 10, in two equal lateral sheaths and sometimes with one, sometimes with two lowest stamens free; filaments all free in their upper third, alternately shorter and longer; *ovary* stipitate, pubescent; *ovules* 1—3, often solitary. *Pod* indehiscent, flat, oblong-lanceolate, obtuse or acute, contracted rather abruptly to the stipe, firmly coriaceous, glabrous, indistinctly veined opposite the one or rarely two seeds, 4—6 in. long, 1—1.25 in. wide; *seed* shortly reniform, compressed, .65 in. long, .45 in. wide.

INDO-CHINA: Burma; Pegu and Proaie, 3Tclelkm\ Brandisl Eurz\ Forest Dept. ! Kalay Hills, Prazer I Ruby Mines Dist.; Abdul Uuq \ Shan Hills; Alpinl

A species known in Burma as *Thit-pot*, or *Thit-poh*, nearly related to *D. cana*, but readily distinguished by its leaves with fewer, much larger, and differently shaped leaflets and by its larger glabrous pods with larger seeds.

PLATE 83. *Dalbergia Kurzii Prain*.—I, Leaf from a Pegu specimen, * *s.*; 2, flowering branch from a Pegu specimen, *w. s.*; 3, bud X 4; 4, calyx, laid open X 4; 5, standard X 4; 6, wings X 4; 7, keel-petals X 4; 8, stamens, usual arrangement X 4; 9, stamens, occasional arrangement X 4; 10, ovary X 4; 11, ovary laid open X 4; 12, ovule X 6; 13, fruiting twig, from a Pegu specimen, *iu s.*; 14, seed, *n. s.*

79. DALBERGIA CANA Grab, in Wall. Cat. 5859 (1832); Kurz Journ. As. Soc. Beng. xlii. 2, 70 (1873); Bak. in Hook. f. Flor. Brit. Ind. ii. 237 (1876); Kurz For. Flor. Burm. i. 341 (1877); Prain Journ. As. Soc. Beng. lxvi. 2, 450 (1897); l.u. 2, 50 (1901).

D. purpurca Wall. Cat. 5809 (1832); Benth. Journ. Linn. Soc. iv. Suppl. 46 in part (1860); 13ak, in Hook, f. Flor. Brit, Ind, ii. 235 in part (1876).

A tree, 40—60 feet high; young branches at first puberulous, soon glabrescent. *Leaves* 10—20 in. long; leaflets 15—19, oblong to oblong-lanceolate, base cuneate, often slightly unequal, apex shortly and abruptly acuminate, firmly chartaceous, when young slightly pubescent on both surfaces, ultimately glabrous above and glabrous or sparingly puberulous beneath, 2—4.5 in. long, .5—1 in. wide; rachis 6—20 in. long, glabrous; petiolules *1 in. long, puberulous; stipules small, lanceolate, deciduous. *Flowers* in lax corymbose axillary panicles 3—3.5 in. long, 1.5—2 in. wide, the peduncles, branches and pedicels puberulous; bracteoles all lanceolate, acute, puberulous, the epicalycine pair half as long as calyx-tube; *calyx* campanulate, purple, faintly puberulous and soon glabrescent, teeth subequal triangular subacute, the two upper subconnate; *corolla* purple, petals all rather long-clawed; standard wide oblong, slightly emarginate; *stamens* 10, in two equal lateral sheaths, filaments free in their upper third; ovary stipitate pubescent; *ovules* 1—3, often solitary. *Pod* indehiscent, flat, ligulate, obtuse, contracted rather abruptly to the stipe, firmly coriaceous, finely velvety throughout, indistinctly veined opposite the seeds, 3—4 in. long, .5 in. wide; *seed* reniform, compressed, .5 in. long, .35 in. wide.

INDO-CUINA: Burma; Pegu, *Brandt's!* Kurz! Tenasseim; Moulmein, *WalUch!* Tavoy, *Shaik Jluqim!*

The Calcutta native collector gives the name of this as *Jaman-paté* at Tavoy.

PLATE 84. *Dalbergia cana Garh.*—1, Flowering specimen from Pegu, *n. s.*; 2, bud X 4; 3, pedicel and epicalycine bracteoles X 4; 4, calyx, laid open X 4; 5, standard X 4; 6, wings X 4; 7, keel-petals X 4; 8, stamens X 4; 9, ovary X 4; 10, ovary laid open X 4; 11, ovule X 10; 12, fruiting specimen from Pegu, *n. s.*; 13, pod, open and showing seed *in situ?* *n. s.*; 14, seed, *n. s.*

% 22. **Volubilis.** *Pod* oblong, thin, samaroid; *style* rather short, cylindrical; *leaflets* velvety; a climber.

A very distinct species which, owing to its style, it is impossible to associate with any of the other group of *Dalbergia*. Its general facies and its bracts show that it has considerable affinity with the *Fectipulaceae**

80. DALBERGIA VOLUBILIS Roxb. Corom. PL ii. 48, t. 191 (1793); Hort. Beng. 53 (1811); DC. Prodr. ii. 417(1825); Spreng. Syst. iii. 193 (1826); Roxb. Flor. Jnd. iii. 231 (1832); Wall. Cat. 5874 (1832); W. & A. Prodr. i. 265 (1834); Grah. Cat. Bomb. 55 (1839); Benth. Journ. Linn. Soc. iv. Snpl. 46 (1860); Dalz. & Gibs. Bomb. Flor. 78 (1861); Brandis For. Flor. 152 (1874); Bak. in Hook. f. Flor. Brit. Ind. ii. 235 (1876); Kurz For. Flor. Burm. i. 346 (1877); Talb. Bomb. List 75 (1894); Woodr. Journ. Nat. Hist. Soc. Bomb. xi. 426 (1897); Praia Journ. As. Soc. Beng. lxvi. 2, 114 (1897); Ixx. 2, 54 (1901); Cooko Flor. Pros. Bomb. i. 400 (1902); Praia Bengal Plants i. 410 (1903).
- D. confertiflora* Benth. Journ. Linn. Soc. iv. Suppl. 41 partly—Oudh and Conc:m plants (1860); Bak. in Hook. f. Flor. Brit. Ind. ii. 233 partly (1876); Talb. Bomb. List 75 (1894), not of Benth. in Pl. Jungh.
- D. purpurea* Benth. Journ. Linn. Soc. iv. Suppl. 46 partly (1860); Bak. in Hook. f. Flor. Brit. Ind. ii. 235 partly (1876), not of Wall'.
- D. stijmlacca* Gamble Darjeel. List 29 partly (1896), not of Roxb.

A large woody climber, 40—60 feet long, sometimes when deprived of foreign support a straggling bush, with twining glabrescent branches here and there thickened and twisted into spiral hooks; branchlets puberulous, sub-bifarious. *Leaves* 4—5 in. long, leaflets 11—13, obovate or ovate-oblong, when young often abruptly shortly acuminate, when full-grown obtuse or slightly retuse and faintly mucronulate, dark-green above, paler beneath, glabrous on both surfaces, .75—1 in. long, .5—.75 in. wide, rachis 3—4 in. long and petiolules .15 in. long, glabrous*; stipules rather large, ovate-lanceolate, wide-based, very caducous. *Flowers* in copious terminal panicles extending sometimes into the axils of the uppermost Wes, 8—12 in. long, 5—6 in. wide, with glabrous peduncles and numerous horizontal or decurved puberulous branches 1—3 in. long, the corymbs congested; bracts small, ovate, subsistent, bracteoles at bases of pedicels lanceolate, persistent, epicalycine bracteoles ovate, persistent; *calyx* campanulate, densely puberulous?, teeth lanceolate, the lowest longest, except the two upper obtuse subconnate; *corolla* pale-blue, petals all rather long-clawed, standard broadly orbicular, emarginate, reflexed at junction of blade and claw; *stamens* 10, usually in two lateral bundles of 5 each, occasionally the lower figure incomplete, filaments free in their upper fourth; *ovary* pubescent, stipitate; style slender, short, stigma minute; *ovules* 1-2. *Pod* indehiscent, distinctly stipitate, linear-oblong, obtuse, rounded or slightly cuneate at base, distinctly reticulated throughout, especially opposite the 1 rarely 2 seeds, glabrous, 2—3 in. long, .75—1 in. wide; *seed* reniform, compressed, .3 in. long, .2 in. wide.

INDIA: Malabar; Travancore, *Lawson* Malabar, *Stocks* S. Kanara, *Metz* N. Kanara, *Talbot* Concan, *Stocks* Coromandelia; Bolimpati, *Wight* Kurnool, *Gamble* Circars, *Roxburgh* Ganjatin, *Gamble* Orissa, *Lace* Chota Nagpur, *Anderson* Campbell, *Wood* *Gamble* Clarke, *T. Thomson* Behar; *Kurz* Ball, *Campbell* Central India; Sagor, *Jerdon* Central Provinces, *Duthiel* HIMALAYA: Submontane forests; Kamaon, *Bhabar*, *Strachey* \$ *Winhrbottom* X Oudh, *Wallich* *Duthie* Gorakhpur, *Duthie* Sikkim Terai, *Anderson* *Gamble* *Clarke* Duars, *um Gbl* INDIA-CHINA: ASSAM; Goalpara, *Clarke* Garo Hills, *Watt* Chittagong; Thanacheri, *Hooker* & *Thomson* *Gamble* Demagri, *Lister* Kodala, *Badakhan* Burma; Kachin Hills, *Shaik Muqim* Chin Hills, *Prazer* *Abdul Huq* Bhamo, *J. Anderson* Shway Yoc, *J. Anderson* Pegu, *Branca* *Kurz* Shan Hills, *Collett*

Prazcrl AbJul Iluq ! Abdul Khahl Tenasserin; Moulmein, Wailichl Cleg horn I Endine Ghor, Gallatyl Mergui, Heifer \ Andamans; S. Andaman, Man \ Ileinigl

PLATE 85. *Dalbergia volubilis* Roxb. — \, Flowering branch from Travancore, leaves young, *n. s.*; 2, leaf from Chota Nagpur, full grown, *n. s.*; 3, bud X 4; 4, pedicel with basal and epicalycine bracteoles X 4; 5, calyx, laid open X 4; 6, standard X 4; 7, wings X 4; 8, keel-petals X 4; 9, stamens, usual arrangement X 4; 10, stamens, occasional arrangement X 4; 11, ovary X 4; 12, ovary, laid open X 4; 13, ovule X 8; 14, twig in fruit from Tenasserim, *n. s.*; 15, pod opened, showing seed *in situ*, *n. s.*; 16, seed, *n. s.*

% 23. **Stipillaceae.** *Pod scmaroid, but more cr less thickened opp<site the seeds ; style suhdate; leaflets obtuse; climbers or casually erect shntbs; bracts large, obtuse.*

A group composed of two very closely allied species which have, by Eeniham and Ly Baker, in iho absence of fruits, been considered foims of one. An examination of the figures will, however, show tho impossibility of this reduction. The group is, in some respects, nearly allied to *D. volubilis*, but is neveithelets very distinct; its nearest ally is apparently *D. Godefrcyi*, an Indo-Chinese species which, on account of its pod, it is necessary to refer to the *Benifomcs*.

81. DALBERGIA FERRUGINEA Roxb. **lort.** Beng. 98 (1814); Flor. Ind. iii. 228 (1832V Benth. Pl. Jungh. i. 256 (1851); Miq. Flor. Ind. Bat. i. 1, 133 (1855); Train Jouin. As. Soc. Beng. lxx. 2, 55 (1901); Volkens in Engl. Bot. Jahrb. xxxi. 464 (1901).

D. elliptic a Span. Ccmp. Bot. Mag. i. 346 (1835); Linnaea xv. 197 (1841).

D. lanceolaria Sjan. Linnaea xv. 197 (1841) not of ATM. f.

D. luzonensis Vog. Nov. Act. Nat. Suppl. i. 133 (1843); Benth. Journ.

Linn. Soc. iv. Suppl. 48 (1860).

D. limonemis Benth. Pl. Jungh. i. 256 (1851).

D. penduliflora Blume ex Miq. Flor. Ind. Bat. i. 1, 133 (1855).

D. slipulacea Benth. Journ. Linn. Soc. iv. Suppl. 48 partly (1860); Bak in Hook. f. Flor. Brit. Ind. ii. 237 partly (1876); Nav. & Fernand Vill. Nov. App. Flor. Philip. 67 (1880); Vidal Plant. Vase. Filip iii' (1886); Warb. in Engl. Bot. Jahrb. xiii. 329 (1891), not of Roxb/

D. Zollingeriana Koord. Meded. s lands Plantent. xix. 431 (1898), not of Miq.

Endespanum pcnduliflorwn Zipp. ex M'q. Flor. Ind. Bat. i. 1, 133 (1855).

A straggling shrub or a climber, branchlets rusty-pubescent, sub-bifarious, recurved, pendulous. *Leaves* 4—8 in. long; leaflets usually 15—21, rarely as many as 25 on young shoots, very rarely 13, ovate-oblong, obtuse or emarginate, base rounded and slightly unequal, '75—1'25 in. long, -45—'75 in. wide, firmly papery, sparsely adpressed-strigose on both surfaces, pubescence sometimes persistent, leaflets sometimes at length quite glabrous, rachis 3 —6*5 in. long, persistently puberulous as are the very short petiolules; stipules wide-obovate, obtuse, membranous, pubescent, very caducous. *Flowers* in small axillary panicles or in large terminal pseudo-panicles extending or not into the axils of the upper leaves, the end of the flowering branch becoming leafy occasionally the leafy terminal portion abortive or obsolete, 8—12 in. long, 4-6 in' wide, peduncles, branches and pedicels pubescent; main-bracts stipular, secondary similar but solitary, basal bracteoles cuneate or ovate-lanceolate, epicalycine ovate, all pubescent,

calyx campanulate, lowest tooth lanceolate longer than tube, lateral acute, upper pair rounded subconnate; *corolla* white, petals all distinctly clawed, standard orbicular, emarginate, often slightly cordate at base; *stamens* 10, in 2 lateral bundles of 5 each, filaments free in their upper third, alternately shorter and longer; *ovary* densely pubescent, distinctly stipitate; style slender, stigma minute; *ovules* 3—4. *Pod* indehiscent, glabrous except the stipe, with a thin but firm coriaceous margin, swollen but not corky, and reticulated opposite the seeds, narrowed abruptly below to a narrow flattened stipe, rounded at the apex with a slight apiculus, usually 1-seeded, but often 2- and sometimes 3-seeded and with a tendency to break off between the seeds, 1*25 in. long when 1-seeded, 2—2*5 in. long when 2—3-seeded, '75 in. wide; *seed* orbicular-reniform, '35 in. long, "3 in. wide.

PHILIPPINES: Luzon; Manila, *Meyenl* *Vital* I Panay, *Vidall* Novaliches, *Loher* ! Montalban, *Loher* ! Samar; *F. Jag or \ Vidall* EASTERN MALAYA: Borneo; Bangi Island at Pankalan, *Fraser* ! Celebes; Minahassa, *Koorcters* ! Moluccas; Tidore, *C. Smith \ Teyimannl* Burn, *Buitenzorg Collectors*] Ceram, *Teymiann* ! *Foersterl* Ceram Laut, *Warburg* ! Timor, *Spanoghe*. PAPUABIA: New Guinea; Sigar, *Warburg* \ Andai, *Beccaril* MICKONESIA : Carolines, *Voellens*.

Koorders gives the name of this in Celebes as *Anioet-icosi*; Vidal gives it as *Balilagaa* in Panay. The writer has seen two original specimens of this species, named by Roxburgh himself.

PLATE 86. *Dalbergia ferruginea* *JRoxb.*—1, Specimen from Ceram, in flower, *n. s.*; 2, bud X 4; 3, pedicel with bracteoles X 4; 4, calyx X 4; 5, standard X 4; G, wings X 4; 7, keel-petals X 4; 8, stamens X 4; 9, ovary X 4; 10, ovary, laid open X 4; 11, ovule X 10; 12, specimen in fruit, from Tidore. *n. s.*; 13, 1-seeded pod, laid open to show seed *in bilu*, *n. s.*; 14, seed, *n. s.*

82. DALBERGIA STIPULACEA Koxb. Hort. Beng. 53 (1814); Flor. Ind. iii. 233 (1832); YtViil Ic. t. 453 (1840); Voigt Hort. Suburb. Calcutta 241 (1845); 13enth. PI. Jungh i. 256 (1831); Miq. Flor. Ind. Bat. i. 1, 133 (1855); Benth. Journ. Linn. Soc. iv. Snppl. 47 (1860); Bak. in Hook f. Flor. Brit. Ind. iv. 237 in part (1876); Kurz. For. Flor. Burm. i. 346 (1877); Gamble Darjeel. List 29 in part (1896); Prain Joum. As. Soc. Beng. lxvi. 2, 451 (1897); lxx. 2, 55 (1901); Bengal Plants i. 410 (1903).

D. tingens Ham. in Wall. Cat. 5860 (1832).

D. cassioides Wall Cat. 5863 (1832).

D. livida Grab, in Wall. Cat. 5866 (1832).

D. cassinoides Miq. Flor. Ind. Bat. i. 1, 133 (1855).

A small straggling tree with spreading branches, or a climber; young branches mb-bifarious, glabrous or puberulous; bark brownish, fibrous. *Leaves* 6—8 in. long; leaflets 17—21, oblong to obovate-oblong, at first acute, ultimately obtuse or refuse at apex, cuneate or rounded at base, 1*25 in. long, *5 in. wide, on young shoots sometimes as much as 2*25 in. long and .85 in. wide, thinly papery, glabrous above dark-green, beneath Bub-glaucous and minutely adpressed-pubescent; rachis 5—6.5 in. long, puberulous as are the petiolules .15 in. long; stipules membranous, ovate-lanceolate, obtuse, caducous. *Flowers* in pseudo-terminal panicles rising among a cluster of scaly more or less deciduous bracts and ending in a new leafy branch; peduncles pubescent, beset with many scattered

empty ovate membranous bracts, branches similar, bracteoles like bracts but smaller, epicalycine pair enclosing two-thirds of calyx-tube; *calyx* campanulate, puberulous, teeth ovate, obtuse or subacute, shorter than tube except lowest lanceolate as long as tube; *corolla* pale-blue, petals all distinctly clawed, standard broad, orbicular, very slightly emarginate; *stamens* 10, in two lateral bundles of 5 each, filaments free in their upper fourth; *ovary* with long, pubescent stipe, elsewhere quite glabrous; style long slender, stigma minute; *ovule* solitary, very rarely ovules 2. *Pod* indehiscent, broad-ligulate to ovate-obtuse, base rounded above the distinct stipe, quite glabrous, firmly coriaceous, not veined except sometimes opposite the seed where the mesocarp is much suberously thickened, almost always 1-seeded, very rarely 2-seeded, 3.5—4.5 in. long, .85—1.25 in. wide; *seed* reniform, .6 in. long, .35 in. wide.

HIMALAYA: Sikkim; Lower Hills and Terai, *Hooker \ Anderson \ Kurz \ King \ Clarke \ Gamble \ Praia*; Bootan; Lower Hills and Duars, *Gamble \ Lister \ Ilainesi*. INDO-CHINA: Assam; Brahmaputra valley, *Hamilton \ Jenkins \ Simons \ Clarke \ Mann \ Fisher \ Peal*; Garo Hills, *Clarice*! Khasia Hills, *Hooker & Thomson*! *Clarke*! Manipur, *Watt*! Naga Hills, *Watt \ Prazer \ Abdul Ilitq*; Silhet, *de Silva \ Clarke*; Chittagong; Kodak, *Badal Khan*; Burma; Kaciliu Hills, *JShai/c Muqim \ Hukung, Griffith*; Chin Hills, *Prazer*; Kalay Bills, *Prazer*; Shan Hills, *Abdul Khalil*; Pegu, *McClelland \ Kurz \ Brandts*; Tenasscrim; Amherst, *WaUicli*; Tavoy, *Gomez \ Shaik Muqim \ Moulmein, Wallich \ Brandts \ CJeghoi*; *Falconer*; Mergui, *Heifer*; Younzalcen, *Gallatyl*; Cochin-China; Bienhoa, at Phoqua, *Pierrel*. CHINA: Yunnan, Szemao Mts., *Henry* 13429!

PLATE 87. *Dalbergia stipitata* f. *fiob.* — 1, Branch in flower, from Sikkim, *n. s.*; 2, bud X 4; 3, pedicel with epicalycine bracteoles X 4; 4, calyx, laid open X 4; 5, standard X 4; 6, wings X 4; 7, keel-petals X 4; 8, ovary X 4; 9, ovary, laid open X 4; 10, twig, with fruit, from Garo Hills, *n. s.*; 11, pod from a Chittagong specimen, *n. s.*; 12, the same looked at from one edge, *v. s.*; 13, pod from another Chittagong specimen, collected in same locality as 11, *n. s.*; 14, seed, *n. s.*

% 24. **Reniformes.** *Pod* falcate-subreniform, thickened throughout; style subulate; erect or climbing,

A group that, it is to be feared, is only subnatural; *D. Godefroyi* departs widely in appearance from the remaining species and but for its thickened pods might have been more naturally placed in the *Stijndaceae*, which group it connects with this one. The others appear, however, to form a fairly natural group of allies.

83. DALBEGIA GODEFROYI Prain Journ. As. Soc. Beng. lxx. 2, 63 (1901).

A woody climber; branchlets sub-bifarious, recurved, puberulous. *Leaves* 3—3.5 in. long; leaflets 6—9, wide-ovate, firmly papery, finely puberulous on both surfaces, base rounded slightly unequal, apex obtuse or slightly emarginate, .6—1.23 in. long, .4—.7 in. wide; rachis 2—2.5 in. long and distinct petiolules puberulous; stipules not seen. *Flowers* in axillary subsimple racemes forming terminal leafy panicles; peduncle and branches puberulous; *calyx* campanulate, in fruit glabrous or puberulous, teeth subequal obtuse shorter than the tube except the lowest lanceolate as long as tube; *petals* not seen; *stamens* in two lateral bundles, anthers not seen. *Pod* indehiscent, obliquely reniform, thinly

woody, finely closely velvety externally, not greatly margined around and not veined externally opposite the seed, narrowed below abruptly to a narrow flattened stipe, rounded at the apex with a slight apiculus, 1-seeded or rarely 2 seeded, with a tendency to break off between the seeds, tho stipe also sometimes with an abortive seed in its upper part, 1*25 in. long, '5 in. wide; *seed* orbicular, reniform; '4 in. long, '35 in* wide.

INDO-CHINA: Siatn; borders of the Great Lake, *Godefroy-Leboeuf* \

The absence of flowers renders the position of this species somewhat doubtful. When first studied by him, the writer from the great general similarity of the fruit was inclined to place it in *Triptolemea*, next *D. parviflora*. The much larger calyx, however, which is hardly distinguishable from that of *D. ferruginea*, and the fact (though this last is not so valuable a character) that its stamens are isodiadelphous, coupled with its general similarity leads him now to think that the species is more satisfactorily placed in *Dalbergaria*. In any case its velvety pods indicate that it is abundantly distinct from either of the species mentioned.

PLATE 88. *Dalbergia Godefroyi* *Train.*—1, Fruiting branch, from Siam, *n. s.*; 2, calyx X 4; 3, pod, laid open, showing seed *in situ*, *n. s.*; 4, seed, *n. s.*

The pod at *a* → has obviously been *at least* 2-seeded, the ultimate joint having snapped off, as happens sometimes in *D. ferruginea* and still more often in *D. parviflora*.

84. DALBERGIA FALCATA *Prain* Journ. As. Soc. 13eng. lxx. 2, 65 (1901).

A climbing shrub; young branches angular, rusty-puberulous, their bases beset with ovate-acute subcoriaceous scaly bracts. *Leaves* 5—7 in. long; leaflets 5—9, the lateral sometimes subopposite, dark-green above, paler beneath, glabrous above, beneath finely adpressed-pubescent, ovate, shortly abruptly acuminate, the terminal rather the largest, 1*5—3 in. long, #75—1*25 in. wide; rachis 4—5 in. long, and petiolules #2 in. long, glabrous; stipules lanceolate, pubescent externally, deciduous. *Flowers* in axillary panicles, 2—3 in. long; peduncles, branches and pedicels rusty-puberulous; bracts deciduous; *calyx* campanulate, upper teeth obtuse subconnate, the others lanceolate the lowest the longest, rusty-puberulous externally; *corolla* not seen; *stamens* 10, in two lateral bundles of 5 each or in one sheath split along upper side; *ovary* stipitate, rusty-pubescent. *Pod* indehiscent, firm, falcate, finely puberulous but at length glabrescent, with a thin suberous mesocarp, 1-seeded or sometimes 2-seeded, 1*5—2*25 in. long, *6 in. wide, '25 in. thick, dark-brown externally with narrow grey lines along ventral suture; *seed* narrow-reniform, compressed, '75 in. long, *33 in. wide*

MALAYA: Borneo; Bintulu, *Beccaril* Sarawak, *Beccari I*

PLATE 89. *Dalbergia falcata* *Prain.*—1, Fruiting branch from Bintulu, Borneo, *n. s.*; 2, calyx, laid open X 4; 3, pod, laid open, showing seed *in situ*, *n. s.*; 4, seed, *n. s.*; 5, v. s. of seed, *n. s.*

85. DALBERGIA KUNSTLERI *Prain* Journ. As. Soc. Beng. lxvi. 2, 121, 453 (1897); lxx. 2, 05 (1901).

An extensive climber, 40—150 feet long, with stem 3—6 inches thick; young branches pubescent, beset at point of origin with scaly bracts. *Liaves* 10—12 in. long;

leaflets 7—9, the lateral subopposite, when mature dark-green glabrous above, sparsely pubescent beneath, when young densely tawny-pubescent on both sides, rigidly coriaceous, elliptic-acuminate, base rounded, 4 — 6 in. long, 2 in. wide; rachis 8 in. long, and petiolules 3 in. long, at first densely pubescent at length glabrescent. *Flowers* in axillary panicles 4 — 6 in. long, 3—4 in. wide; peduncles, branches and pedicels densely rusty - puberulous; bracts ovate-lanceolate or lanceolate, pubescent, deciduous; *calyx* campanulate, teeth ovate-lanceolate, obtuse except the lanceolate lowest; *corolla* dark-blue, petals all long-clawed, standard orbicular, emarginate; *stamens* 10, usually in one sheath slit along upper side, only occasionally in two lateral bundles of 5 each, the lower side also being slit; *ovary* long-stipitate, pubescent especially on the stipe; style long slender, stigma small capitate; *ovules* 2—4. *Pod* indehiscent, finely persistently pubescent, not mamillate, mesocarp thick, corky, endocarp firm, usually 1-seeded sometimes 2-seeded, rigid, falcate or subfalcate, 1*5—2*5 in. long, '9 in. wide, #4 in. thick, with grey lines alongside the sutures when ripe, *seed* reniform, compressed, #7 in. long, #4 in. wide.

MALAYA: Perak; Goping, *Kunstler*X Kinta, *Kunstler*l

PLATE 90. *Dalbergia Kunstleri* Prain. 1, Flowering twig, from Kinta river, Perak, *n. s.*; 2, bud X 4; 3, pedicel with bracteoles X 4; 4, calyx, laid open X 4; 5, standard X 4; 6, wings X 4; 7, keel-petals X 4; 8, stamens, usual arrangement X 4; 9, stamens, occasional arrangement X 4; 10, fruiting branch from Goping, Perak, *n. s.*; 11, pod opened, showing seed *in situ*, *n. s.*; 12, cross section of pod, showing thickened mesocarp, *n. s.*; 13, seed, *n. s.*

86. DALBERGIA RENIFOEMIS Roxb. Hort. Bong. 53 (1814); Flor. Ind. iii. 226 (1832); Wight Ic. t. 261 (1840); Bak. in Hook. f. Flor. Brit. Ind. ii. 238 (1876); Prain Journ. As. Soc. Beng. Ixx. 2, 64.

D. stipulata Wall. Cat. 5868 partly (1832).

*D. fiexuoso*i Grah, in Wall. Cat. 5875 (1832); Benth. PI. Jungh. i. 256 (1851); Journ. Linn. Soc. iv. Suppl. 48 (1860).

Drcpanocarpus reniformis Kurz For. Flor. Burm. iv. 336 (1877).

A spreading bushy tree, 30—40 feet high; young branches rusty- or tawny-pubescent but soon glabrescent; with rusty-pubescent scaly bract at their bases. *Leaves* 7—12 in. long; leaflets 7—11, ovate or ovate-oblong, apex abruptly obtusely or retusely acuminate, base cuneate or rounded, when young very sparingly and fugaciously pilose, when mature quite glabrous, often subopposite, firmly chartaceous, 2—4 in. long, i_2 in. wide; rachis 5—8 in. long, at first puberulous soon glabrous, petiolulea •25 in. long, persistently puberulous or pubescent; stipules ovate-lanceolate, rusty-pubescent, deciduous. *Flowers* in lateral panicles, 4 in. long, 2 in. wide, on the young branches; peduncles, branches and pedicels pubescent; bracteoles ovate, deciduous; *calyx* campanulate, rusty-pubescent, teeth ovate-obtuse except the rather longer acute lowest; *coroVa* white, petals all long-clawed, standard orbicular, emarginate; *stamens* 10, in two lateral bundles of 5 each; *ovary* pubescent especially on the rather long stipe; style long slender, stigma small capitate; *ovules* 2—3. *Pod* indehiscent, when young rather closely puboscent but soon glabrescent, when mature uniformly lenticular-niamillate, often rather irregular, mesocarp thick corky, endocarp firm, usually 1-seeded,

sometimes 2-seeded, rigid, falcate or subfalcate, 1*25—2 in. long, '75 in. wide, '4 in. thick; *seed* reniform, '5 in. long, #3 in. wide.

INDO-CHINA: Assam; Silhet, *Smith] do Silval Clarke] Cachar, Praserl* Burma; Pegu, *Kurz] Brandis] Kareni, Kurz I Tenasserira*; Martaban, *Kurz] Falconer \ Cleg ho nil Beddomel Chuku Plains, Gallathj*!

PLATE 91. *Dalbergia reniformis Roxb.*—1, Flowering branch from Silhet, *n. s.*; 2, bud X 4; 3, pedicel with bracteoles X 4; 4, calyx, laid open x .1; 5, standard X 4; 6, wings X 4; 7, keel-petals X 4; 8, stamens X 4; 9, ovary X 4; 10, ovary, laid open X 4; 11, ovule X 12; 12, twig with unripe fruit, from the Karen Hills, *7i. s.*; 13, ripe fruits from Cachar, *n. s.*; 14, pod, laid open, showing seed *in situ*, *n. s.*; 15, cross-section of pod, showing thickened mesocarp, *n. s.*; 10, seed, *n. s.*

DOUBTFUL AND EXCLUDED SPECIES.

DOUBTFUL SPECIES.

DALBERGIA AESTIVALIS Pierre MSS.

Only a leaf-specimen of this proposed species has been available for study. It is certainly quite different from any of the other *Dalbergias* in Herb. Pierre, but it cannot as matters stand be distinguished from *D. Olkeri* Gamble and is almost certainly identical with Gamble's tree. The difficulty does not lie so much in any doubt on this point as in the possible identity of *D. aestivalis* with *D. laccifera* Laness. The note on the ticket reads:—" *Dalbergia aestivalis* Pierre. Crescit in vicinibus Song-lu in prov. Bienhoa. Arb. 20 — 30-metr. Moi. *Chlieu lai Bon dam* (*doumc*). Ann. *Cay cam lai*."

DALBERGIA ENTADIOIDES Pierre MSS.

This is known only in leaf and flower: it cannot be separated from *Z. foliacea* Wall, by its flowers \ the leaflets, however, though of exactly the same shape, are glabrous beneath. If when fruits are reported this is found to deserve specific rank, Pierre's name must be taken up for the species.

DALBERGIA LACCIFERA Laness. PL Util. Col. Franc?, 289 (1886).

(En Kmer. *Dcm-chloeii-sniwl*.) Arbre de 20 à 25 mètres sur 40 à 60 centimetres de diamètre. Bois gris brun, excellent pour le placage. Il sert à Clever le *Coccus lacca* et les Cambodgiens prétendent qu'un arbre donne de 10 & 20 kilogrammes de laque par année." This note by Lanessan is an indifferent substitute for the description that is expected with a proposed new species. The name is not used by M. Pierre in his Herbarium; none of Pierre's specimens are noted as taken from a tree on which *Coccus lacca* is raised; we are therefore left with no guide except the vernacular name. "Snuol" does not assist greatly, since it is noted by Pierre as being applied both to *D. fxiniculata* and to *D. Hemsleyi*; the first species may be excluded since its timber is not suitable for veneering. We are therefore left to decide whether we have here to deal with *D. Hemsleyi*, or with *D. aestivalis*, to which latter the two names "dom" and "chlceu" are known from Pierre's notes to be applied, and are apparently restricted. The likelihood is therefore clearly greater that *D. laccifera* and *Z. aestivalis* are the same tree; if this be so, then *D. Oliveri* and *D. laccifera* are almost certainly identical. The matter must be left to botanists in French Indo-China to settle; the important point is that, if the two be really the same, the name *D. laccifera* must replace the name *D. Oliveri*.

DALBERGIA LANCEOLAKIA ? Llanos Mem. Acad. Cienc. Madr. (1858), not of Linn. f.

This is said to have the "pod linear, silky/" which effectively disposes of the identification proposed by Llanos. The ovary of *D. Minahassae*, a species allied to *D. lanceolaria* that does occur in the Philippines, is densely silky and it is possible that its pods, which are not yet reported, may also be silky. But this suggested identification is only tentative; besides it must not be forgotten that Lamarck disarranged the original *D. lanceolaria* by referring to that species *Dem's* (*Brachypterimi*) *andens*. If Llanos relied on Lamarck's citations when he identified his Philippine plant, he may very well be referring to a species of *Dirris*.

DALBERGIA PINNATA (*Denis' pinnata* Lour. Flor. Cochin Chin. 432).

Usually referred to *D. tamarindifolia*. There are, however [*vide ante* p. 49), certain features in Loureiro's description that are antagonistic to this identification and the specie*, which is obviously a *Dalbergia*, is more likely to be *D. Millettii* than to be *I), tamarindifolia*. The point can only be settled in the field by the botanists of Cochiu-China and for the moment it is more advisable to treat this as a species of doubtful identity.

DALBERGIA PURPUREA? Laness. PI. Util. Col. Fran?. 289 (1886), not of Wall.

To this species Lanessan gives no clue, the only certainty is that it is not Wallich's tree of the name ; it would hardly matter if it were, since Wallich's name is a mere synonym, The probability is that this is one or other of group of four known as *Cam hi* in Kmsr, It has been tentatively suggested that it is the same as *D. dongnaiensis*, which is the only one of the four where the flowers are known, and which happens to have them blue.

DALBERGIA SAIGONENSIS **Pierre** MSS.

Referred in this paper (*vide ante* p. 89), as a variety, to *D. pmiculata*. This tree may, however, when flowers are reported, prove to deserve the specific rank claimed for by At. Pierre, in which case Pierre's name will stand.

DALBERGIA VOLUBILIS Llanos Mem. Acad. Cienc. Madr. (1858), not of Roxburgh.

All that Llanos says of this is:—"pod linear, subincurved," which is enough to prove that his plant is not Roxburgh's. The identification he suggests presupposes a climbing habit, and the only climbing *Dalbergia* in the Philippines of which it could possibly be said that the pods are "linear" is *D. pohjphyll* : this identification (*viile ante*, p. 71) is, however, purely tentative and conjectural.

EXCLUDED SPECIES.

<i>Dalbergia acuminata Hassk.</i>	=	<i>Denis uliginosa.</i>
<i>alata Roxb.</i>	=	<i>thyrsiflora.</i>
<i>angustifolia Ilcnsk.</i>	=	<i>Millettia sericea.</i>
<i>arborea Willd., not of Ileyne</i>	=	<i>Pongamia glabra.</i>
<i>argentea Zoll.</i>	=	<i>Denis thyrsiflora.</i>
<i>Crowey Rozb.</i>	=	<i>robusta.</i>
<i>Delavayi Franch.</i>	=	<i>Cladrastis Delavayi.</i>
<i>Diphaca Pers.</i>	=	<i>Ormocarpum senoides.</i>
<i>glaucescens Zipp., not of Benth.</i>	=	<i>Denis elliptica.</i>
<i>heterophylla Willd., not of l'oir.</i>	=	<i>uliginosa.</i>
<i>japonica G. Don.</i>	=	Quid ? (see note below).
<i>Krowee Roxb.</i>	=	<i>Denis robusta.</i>
<i>lanceolaria Demist., not of Linn. /.</i>	=	<i>scandens.</i>
<i>lanceolaria var. ft Lamk</i>	=	<i>scandens.</i>
<i>lanceolaria Moon, not of Linn, f</i>	=	<i>Pericopsis Mooniana.</i>
<i>marginata Roxb.</i>	=	<i>Denis marginata.</i>
<i>Momsita Ham.</i>	=	<i>robusta.</i>
<i>Mooniana Thw.</i>	=	<i>Pericopsis Mooniana.</i>
<i>ougeinensis Roxb.</i>	=	<i>Ougeinia dalbergioides.</i>
<i>pubinervis Span.</i>	=	<i>Denis pubinervis.</i>
<i>pulchra HbK</i>	=	<i>Millettia pulchra.</i>
<i>purpurea Reiniv. j not of Well.</i>	=	<i>Denis elliptica.</i>
<i>radicans Zipp.</i>	=	<i>uliginosa.</i>
<i>repens /?^w.</i>	=	<i>uliginosa.</i>
<i>robusta Miq.</i>	=	<i>scandens.</i>
<i>robusta Roxb.</i>	=	<i>robusta.</i>
<i>rostrata Hassle, not of Grah.</i>	=	<i>malaccensis.</i>
<i>scandens Roxb.</i>	=	<i>scandens.</i>
<i>sericea Spreng., not of G. Don</i>	=	<i>Millettia sericea.</i>
<i>tephrobioides W. ty A.</i>	=	<i>pulchra,</i>
<i>timorensis DC.</i>	=	<i>Denis scandens.</i>
<i>venusta Zipp.</i>	=	<i>scandens.</i>

The only species of the list of which the identity is not clear is *Dalbergia japonica* G. Don. No *Dalbergia* reaches Japan; besides *D. japonica* has opposite leaflets. No *Burreria* reaches Japan, nor does any *Millettia*. *Wistaria japonica* being a climber and having leaflets green beneath, with flowers that are not eecund, should therefore also be excluded. *Sopnora japonica* agrees with Don's description in being erect, in having secund flowers and leaves with opposite leaflets glaucous beneath; one is, however, unwilling to think that, with staminal features so divergent, Gk Don had placed this species in *Dalbergia*. Perhaps some Japanese botanist will solve the problem.

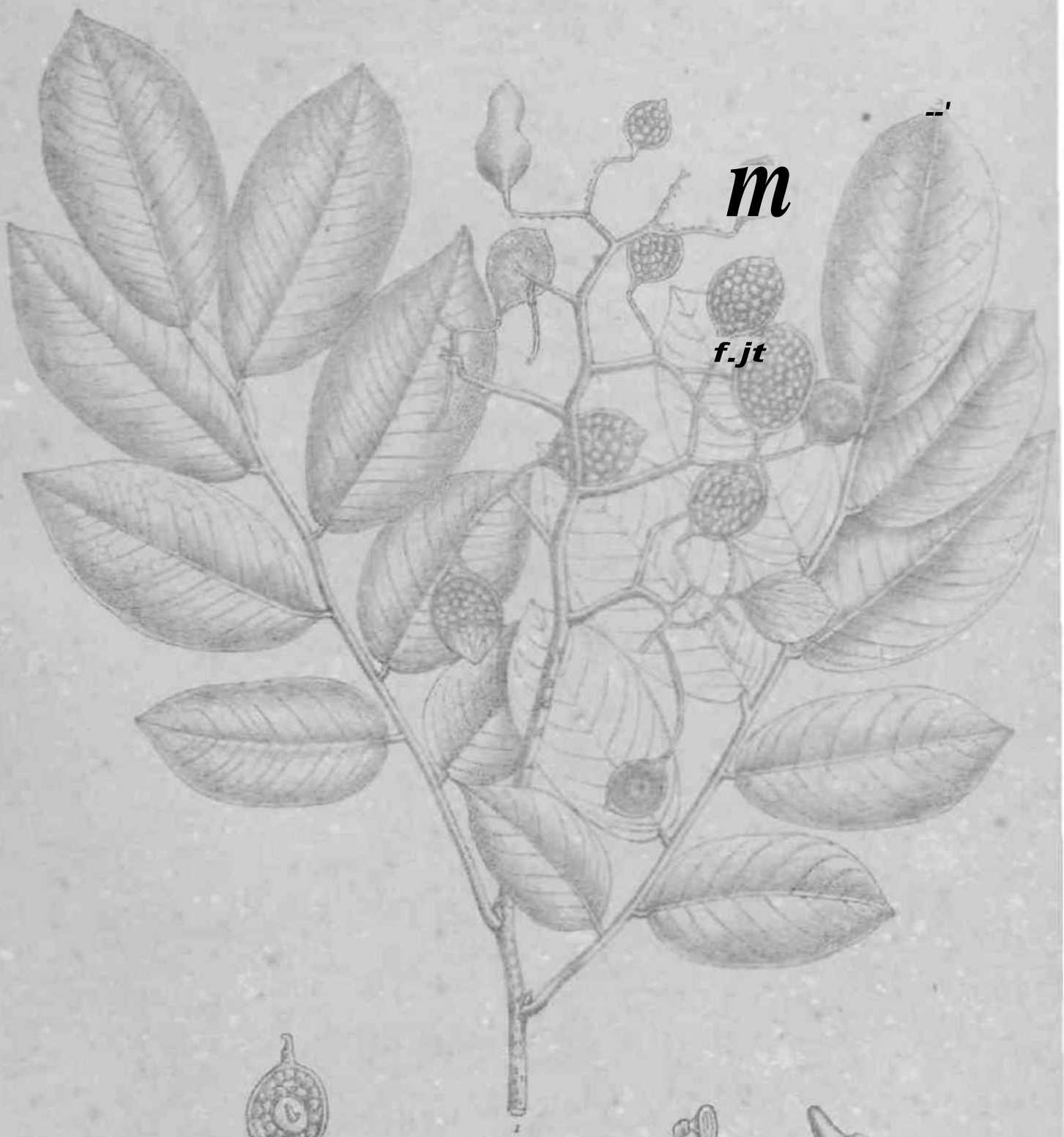
INDEX.

- Acer Berangan 3 5
Acouroa Aubl. 10, 3 1
 Adanson 1
 Alcoholism, *D. spinosa* used in
 Aloes-wood 8 3
 Amantti 3 6
Amerimnon P. Br. 2, 10, 3 1
 „ *horridam* Demist. 3, 4, 4 4
 „ *Mimosella* Blanco 4 2
 „ *sympatheticum* O. Kuntze 3
Amerimnon (*sub-yen.*) 5 9 ; 8, 2 5
 Amoet-wosi 1 0 2
Ana-mullu Rheede 3. 4 4
 Angaria 9 4
 Areca 4 8
 Arnott 5
 Asia, Botanical provinces of S.-E. 1 2
 Atom Sali 3 8
 Australia n
 Babuklia 8 8
 Bailloa 6
 Bai-tuk 6 5
 Baker 7
 LSalibagan 1 0 2
 Bark of *D. rimosa* chewed 3 8
 Bentham 5
 Betel nut 4 9
 Bihti mara 5 8
 Blume 3
 Borneo 1 5
 Botanical provinces of S.-E. Asia 1 2
 „ Rubarcas 1 2, 1 3
 Browne, P. 2, 1 0
 Cim-lai 1 6, 9 6, 9 7
 Canae I. 9 5 ; 3 0
 Carolines. 1 1
Cassia candanensis Dencst. 6 4
 „ *timorensis* H. f. & T. 7 4
 Cay-cám-lai 9 3, 1 0 7
 Cay-me-muk 6 5
 Celebes 1 5
 Central China 1 3
 „ Tndo-China J 8
 Ceylon U
 Chandan 8 9
 Chewing bark of *T>. rimosa* 3 8
 „ root of *D. pinnata* 4 8
 China j 3
 China Blackwood 4 7
 Chisel-handlo Wood 7 8
 Chlieu lai Boa-dam 9 3, 1 0 7
 Chloeu 1 0 7
Cladrastis Delavayi Prain 1 0 9
 Classification of species of *Dalbergia* 5
Coccus lacca 1 0 7
 Congestae % 6 5; 2 8
 Coromandelia 1 7
 Cra-hnung 7 9, 8 3
 Cultrateae % 5 5; 2 7
 Dalberg 1
Dalbergaria (Sub-gen.) 7
 Dalbergiana § 85; 5, 6, 8, 9, 2 3, 2 4, 2 5, 2 9
 Dalbergia, Classification of species of 5
 „ distribution of sections of 2 2
 „ distribution of species
 of 1 1, 2 3
 „ origin of the name 1
 „ validity of the name 1 0
 DALBEBGLA Linn, f. 3 1 ; 2 5
 „ *acaciaefolia* Balz 6 8 ; 1 6, 2 0/2 8
 „ *ac-uminata* Hassk. 1 0 9
 „ *aesivalis* Pierro 9 2, 1 0 7
 „ *alata* Eoxb. 2, 1 0 9
 „ *Albertisii* Prain 3 3; 8, 1 5, 1 9, 2 2, 2 6
 „ *Amerimnum* Benth. 2, 8
 „ *angustifolia* Hassk. 1 0 9
 „ *anomala* Pierre 8 7
 „ *arborea* Heyne 3, 9 3
 „ *arborea* Willd. 1; 3, 4, 1 0 9
 „ *argentea* Zoll. 1 0 9
 „ *armata* E. Mey. 9
 „ *assamica* Benth. 8 9; 1 3, 3 7, 2 1, 3 0
 „ *assamica* BeDth. 8 5
 „ *Balansae* Prain 9 0; 1 2, 1 3, 1 4, 2 1, 3 0
 „ *Barclayii* G. Don. 4
 „ *barieusis* Pierre 9 6; 3 8, 2 1, 3 0
 „ *Beccani* Prain 3 3; 8, 1 5, 1 9, 2 2, 2 6
 „ *Benthami* Prain 6 2 ; 1 4, 2 0, 2 8
 „ *Blumci* Hassk. 6 9
 „ *borneensis* Prain 7 5, 1 5, 2 1, 2 4, 2 9
 „ *burmanica* Prain 7 1; 1 3, 2 1, 2 8
 „ *cambodiana* Pierre 7 9; 1 8, 2 1, 2 9
 „ *cana* Gra\ 9 9; 4, 1 8, 2 1, 3 0
 „ *candanalensis* Train 6 4
 „ *C'Issinoides* Miq. 1 0 2
 „ *cassioides* Wall. 4, 1 0 2
 „ *Championii* Thw. 6 0
Dalbergia cocliinchinensis Pierre 8 3 ; 1 8, 2 1, 2 9
 „ *Collettii* Prain 1 5 3; 1 4, 1 8, 2 0, 2 7
 „ *confertiilora* Benth. 5 2 ; 1 7, 1 8, 2 0, 2 4, 2 7
 „ *confertiflora* Benih. 1 (K)
 „ *congesta* Benth. 6 6 ; 1 6, 1 7, 2 0, 2 4, 2 8
 „ *congesta* Bak. 6 0
 „ *coromandoliana* Prain 4 6; 1 7, 2 0, 2 7
 „ *corymbifera* BI. 1 1 ^
 „ *Crowey* Hoxb. 2, 1 0 9
 „ *cultrata* Grah. 5 5; 4, 1 8, 2 0, 2 7
 „ *Cumingiana* Benth. 3 4; 1 4, 1 9, 2 2, 2 3, 2 6
 „ *Cumingii* Benth. 3 i
 „ var. *Zolling-eriana* Benth. 3 5
 „ *Dslivayi* Francli. 1 0 9
 „ *densa* Benth. 7 3 ; 1 1, 1 5, 2 1, 2 4, 2 8
 „ „ *vir. australis* Prain 7 3
 „ *Biphaca* Perj. 1, 2, 1 0 9
 „ *discolor* ^/. 3 6 ; 1 4, 1 5, 1 9, 2 ?, 2 3
 „ „ var. *pallens* ~\Liq. 3 7
 „ *discolor* Miq. 4 1
 „ *diversijulia* BI- 6 0
 „ *domivgensis* Pers. 1
 „ *dongnaiensis* Pierre 9 7; 1 8, 2 1, 3 0
 „ *Duperreana* Pierre 9 7 ; 1 8, 2 1, 3 0
 „ *Dyeriana* Prain 5 1; 1 3, 1 4, 2 0, 2 7
 „ *elliptica* Span. 1 0 1
 „ *eniarqinatu* Prnin 8 1
 „ *emarginata* Roxb. 2, 8 0
 „ *emarginata* Hoyle 8 5
 „ *entadioides* Pierre 5 4 ; 1 0 7
 „ *falcata* Prain 1 0 4 ; 1 5, 2 1, 3 0
 „ *ferruginea* Roxb. 1 0 1 ; 2, 1 1, 1 4, 1 5, 2 1, 2 4, 3 0
 „ *ferruginea* Hohenack. 4 3
 „ *ferruginea* Prain 9 1
 „ *flexuosa* Grah. 4, 1 0 5
 „ *foliacea* Wall. 6 4; 4, 1 8, 2 0, 2 7
 „ *foliacea* Gamble 3 8
 „ *foliolosa* Bjnth. 9
 „ *Forbasii* Prain 3 3; 1 6, 2 0, 2 6

- Dalbergia frondosa* Miq. . . . 42
 „ *froniosa* var. *ft.* Miq. . . . 44
 „ *frondosa* Eoxb. . . . 2, 93
 „ *frondosa* Wall. . . . 43
 „ *fusca* Pierre 55 ; 13, 18, 20, 27
 „ *Gardneriana* Benth. 66 ; 16, 20, 28
 „ *glauca* Kurz 76
 „ *glauca* Wall. . . . 4, 78
 „ *glaucescens* Zipp. . . . 109
 „ *glomeriflora* Kurz 77 ; 18, 21, 29
 „ *Godefroyi* Prairt 103 ; 18,21,30
 „ *Hancci* Benth. &0; 14, 20, 27
 „ *Havilandi* Praia 60; 15, 20, 28
 „ *Hemsleyi* Praia 94 ; 18, 21, 30
 „ *Henryana* Prain 62 ; 13, 14, 20,28
 „ *heptaplylla* Poir 4
 „ *htterophylla* Willd. 1, 3, 109
 „ *Jiircina* Ham. . . . 4, 93
 „ *hircina* Wall. . . . 85
 „ *horrida* G-rah. . . . 4, 36
 „ *Hoseana* Prairc 67 ; 15, 20, 28
 „ *Hullettii* Prain 59; 15, 20, 28
 „ *liupeaua* Hance 88; 13,14' 21,29
 „ *Jaherii* Buerck 71 ; 15, 21, 28
 „ *japonica* G. Don 109
 „ *javanica* Miq. . . . 81
 „ *Junghuhnii*.Be?i*i*.i.40; 16,20,26
 „ *Junghuhnii* Bak. 40, 41, 42
 „ j, var. *Scortechinii* Prain 40
 „ *Junghuhnii* Benth. . . . 44
 „ *Kingiana* Prain 61 ; 13, 14, 17, 20,28
 „ *Krowee* Eoxb. . . . 109
 „ *Kunstleri* Pram 104; 16, 21, 30
 „ *Kurzii* Prain . 98 ; 18, 21, 30
 „ *Kydiana* Eoxb. . . . 80
 „ *laccifera* Laness. . . . 92, 107
 „ *lanceolana* Linn.f. , 93; 1, 2, 3, 4, 11, 12, 16, 17, 21, 24, 30
 „ *lanceolaria* Dennst. . . . 109
 „ *lanceolana* Forbes & Hemsl. 90
 „ *lanceolaria* Gamble 89
 „ *lanceolaria* Llanos 91, 107
 „ *lanceolaria* Moon 109
 „ *lanceolaria* .Nav. & Vill. 42
 „ *lanceolana* Span. . . . 101
 „ *lanceolaria* var. *ft.* Lamk 2, 3, 109
 „ *lanceolata* Zipp. . . . 101
 „ *latifolia* Roxb. 80; 1, 2, 1?, 16, 17, 18, 21, 29
 „ „ rar. *sissoides* BeDD. 8L
 „ *latifolia* Koord. & Vol. 81
 „ *latisiliqua* Desf. . . . 2
 „ *limonensis* Benth. . . . 101
 „ *Pittorall's* Hassk. . . . 45
 „ *livida* Grah. . . . 4, 102
- Dalbergia livida* Wall. * . . . 69
 „ *luzonensis* V^Tog. . . . 101
 „ *malabarica* Prain 67 ; 16, 20, 28
 „ *mammosa* Pierre 74; 18, 21, 30
 „ *marginata* Eoxb. . . . 2, 109
 „ *melanoxylo*n Giill. Sf Perr. 46 ; 16, 20, 27
 „ *menoeides* Prain 64; 15, 20, 28
 „ *Millettii* Benth. 47; 12, 13, 14, 20, 23, 27
 „ *Millettii* Harms 49
 „ *Millettii* Prain 49
 „ *Mimosella* Prain 42 ; 14, 20, 22, 2Q
 „ *mimosoides* Franch. . 49 ; 13, 11, 17, 20, 23, 27
 „ *Minahassae* Koord . 9), 14, 15, 21, 30
 „ *Mom sit a* Ham. . . . 109
 „ *Monet aria* Linn. f. . 1, 2, 3
 „ *monosperma* Dalz. . . . 64
 „ *Mooniana* Thw , . . . 109
 „ *multiflora*%7ie 13,4,16,20,127
 „ „ var. *glabrescens* Prain 44
 „ *multijuga* Grah. . . . 4, 69
 „ *nigrescent* Kurz 87
 „ *niida* Zipp. . . . 60
 „ *oblongifolia* G. Don . . . 47
 „ *obtusifolia* Prain 76 ; 13, 18, 21,29
 „ *Oliveri* Gamble 92; 18, 21,30
 „ *ougeinensis* Roxb. . . . 2, 4, 109
 „ *ovata* Grah. 78; 4, 18, 21, 29
 „ „ var. *obtusifolia* Buk. 76
 „ „ var. *puberula* Kurz 78
 „ *paniculata* Roxb. 87; 1, 2, 4, 17, 18, 21,24,29
 „ „ var. *saigonensis* Prain 88
 „ *paniculata* Kurz 92
 „ *paniculata* Wall. . . . 43, 52
 „ *paniculata* W. & A. . . . 93
 „ *parc[flora* Benth. . . . 31
 „ *parviflora* Roxb. 34; 2, 5, 6, 14, 15, 16, 18, 19,22, 2Q
 „ *parviflora* Prain 38
 „ *pendula* Ten. . . . 57
 „ *penduliflora* Bl. . . . 101
 „ *pentaphylla* Poir. . . . 4
 „ *phyllanthoides* Bl. . 44 ; 15, 16, 20, 27
 „ „ rar. *sennoides* Prain 45
 „ *Pierreana* Prain 72 ; 18, 21, 28
 „ *pinnata* Prain. 48 ; 12, 108
 „ *polyadelpa* Prain 84; 13, 14, 21, 24, 29
 „ *polyphylla* Benth. 70; 14, 20, 28
 „ *polyphylla* Benth. . . . 44, 48
 „ *polyphylla* Seem. . . . 48
 „ *Prazeri* Prain 92
- Dalbergia pseudo-sissoo* Miq. • 60
 „ *pubinervis* Span. . . . 109
 „ *pulchra* Voigt 109
 „ *purpurea* Bak. . . . 92
 „ *purpurea* Benth.' • 100
 „ *purpurea* Kurz 18
 „ *purpurea* Laness. . . . 97, 108
 „ *purpurea* Eeinw. . . . 109
 „ *purpurea* Wall. . . . 4, 99
 „ *radicans* Zipp. . . . 109
 „ *reniformis* Roxb. 105; 2, 4, 5, 6, 17,18,21,30
 „ *repent-Sip&n.* 109
 „ *rimosa* Roxb. 38; 2, 12, 13, 14, 17, 20, 22, 23, 2Q
 „ *robust a* Miq. . . . 109
 „ *robusta* Eoxb. , . . . 2, 109
 „ *robusta* Wall. . . . 85
 „ *rostrata* Grah. 60; 4, 11, 15, 16, 20, 23, 24, 28
 „ *rostrata* Hassk. . . . 109
 „ *rubiginosa* Roxb. 63 ; 1, 2, 3, 16, 20, 28
 „ *rubiginosa* Benth. . . . Q2
 „ *rubiginosa* Kurz. . . . 52
 „ *rufa* Grah. . . . 4, 69
 „ *sacerdotum* Prain 86; 14,21, 29
 „ *saigonensis* Pierre 88, 108
 „ *scandens* ftoxb. 2, 3, 4, 109
 „ *Scortechinii* Praia 4) ; 15, 16, 20, 26
 „ *sennoides* Bl. . . . 44
 „ *sericea* G, Don 85; 4, 17, 21, 29
 „ *sericex* Spreng. . . . 4, 109
 „ *sissooides* Grah. 81 ; 4, 16, 21, 29
 „ *Sissoo* Roxb. . . . 67; 2, 8, 9, 12, 17, 20, 23, 21, 27
 „ *Sissoo* Miq. . . . 60
 „ *spinosa* Roxb. . . . 35 ; 2» 4, 5, 14, 17, 18, IP, 22, 23, 26
 „ *spinosa* W. & A. . . . 46
 „ *stenocarpa* Kurz Ho
 „ *stenophylla* Prain, 49 ; 13, 14, 20, 23, 27
 „ *stereoracea* Maing. . . . 42 ; 3 6, 20, 26
 „ *stipulacea* Roxb. . . . 102 ; 2, 4, 8, 13, 17, 18, 21, 24, SO
 „ *stipulacea* Benth. . . . 101
 „ *stipulacea* Gamble 100
 „ *stipulata* Wall. . . . 4 ; 74, 105
 „ *Stocksii* Benth. . . . 4§
 „ *subsympathetica* Piaiu 44
 „ *sywpathelica* IVinimo 4, 43
 „ *szemaoensis* Prain 91 ; 13f 14,21,30
 „ *tamarindifolia* Roxb. . . . 69 ; 2, 3,4,9, 12, 13, 11, 15, 16, 17, 18, 20, 23, 21, 28

<i>Dalbergia tamarindifolia</i> Benth.	68	<i>Ecastaphyllum Beccarii</i> Prain	33	Nummularieae %	32; 25
" <i>tamarindifolia</i> Eoxb.	49	" <i>Monetaria</i> Pors.	1	Origin of the name <i>Dalbergia</i>	1
" " var. <i>acacice-</i>		<i>Endespermum</i> §	59; 9, 23, 24, 25, 28	<i>Ormocarpuin.</i> Beauv.	1
<i>folia</i> Bak.	68	<i>Endespermum</i> Bl.	3, 5, 10, 31	" <i>scandens</i> Teysm.	33
" " var. <i>pubes-</i>		" <i>dioer si folium</i> Bl.	60	" <i>sennoides</i> DO.	190
<i>cens</i> Bak.	67	" <i>pendulijorum</i> Zipp.	101	<i>Ougeinia dalbet-gioides</i> Benth.	2,109
" <i>tephrosioides</i> W. & A.	109	" <i>retusum</i> Bl.	69	<i>Ovatae</i> %	76; 29
" <i>Thomsoni</i> Benth.	• 39; 17,	" <i>scandens</i> Bl.	69	<i>Padouk</i> po.	77
	20, 22, 26	" <i>zeylanicum</i> Champ.	6)	<i>Paitan.</i>	89
" <i>Thomsoni</i> Kurz	52	<i>Etam sali</i>	38	<i>Pan leaf.</i>	48
" <i>timorensis</i> DC.	3, 109	<i>Fiji.</i>	11	<i>Fanchioli.</i>	65
" <i>tingens</i> Ham.	4, 102	<i>Foliaceae</i> %	50; 27	<i>Papuasia.</i>	1 5
" <i>tonkinensis</i> Train	79, 12, 14,	<i>Graham</i>	4	<i>Parviflorae</i> If • • • •	34; 26
	21, 29	<i>Halubanit</i>	9 1	<i>Payasi.</i>	71
" <i>torta</i> GW*.	64; 3, 4, 5, 6,	<i>Hecastophyllum</i> H. B. & K.	10, 31	<i>JPericopsis Mooniana</i> Thvr.	109
	11, J2, 13, U, 15, 16, 18,	<i>Hiern.</i>	12, 11	<i>Persoon</i>	J
	20, 23, 24, 28	<i>Himalaya</i>	17	<i>Philippines</i>	14
" <i>velutina</i> Ten*7i.	74; 4, 9, 15, 16,	<i>Incense, D. parvijlora</i> a source of	35	<i>Phyllanthoides</i> Af	43; 27
	18, 21, 29	<i>India</i>	16	<i>Piper Benth</i> Linn.	48
" var. <i>Maingayi</i>		<i>Indo-china</i>	1 7	<i>Platymiscium</i> Vog.	5
<i>Train</i>	75	<i>Isopou puttou</i>	8 1	<i>Podiopetalum</i> §	50; 9, 23, 21,
" <i>venusla</i> Zipp.	109	<i>Jaman-pate</i>	9 9		25, 27
" <i>volubilis</i> Rcx.	100; 2, 17, 18,	<i>Java</i>	16	<i>Podiopetalum</i> HochsL	5, 10, 31
	21, 24, 30	<i>Kang-kin-ten</i>	4 9	<i>Poiret.</i>	1
" <i>volubilis</i> Llanos	• 70, 108	<i>Kan-ma</i>	78	<i>Polyadelphia</i> f	83; 29
" <i>Wattii</i> Clarke	95; 17, 21, 30	<i>Karin tag era</i> Eheede	3, 64	<i>Polyphylla</i> ^"	68; 28
" <i>yuimanensis</i> Franch.	52; 13,	<i>Kayoe lacca</i>	3 5	<i>Pong Jim</i> Adans.	1, 3
	14, 20, 27	<i>Kuntze</i>	1, 3, 1 1	<i>Pongamia</i> Vent.	1
" <i>zeylanica</i> Eosb.	2, 93	<i>Kurz</i>	7	" <i>glabra</i> Vent.	2
" <i>zeylanica</i> Wall.	55	<i>Lac reared on a Dalbergia</i>	107	<i>Provinces of S. E. Asia, botanicil</i>	12
" <i>Zoilingetiana</i> Koord.	101	<i>Lacca lignum</i> Eumph.	25	<i>Pterocarpus</i> Berg.	10, 31
" <i>Zoilingeriana</i> Miq.	• 35	<i>Lamarck</i>	1	<i>Pungamia</i> Lamk.	1
<i>De Candollo</i>	3	<i>Lanceolarieae</i> %	87; 29	<i>Ileniformes</i> l	103; 30
<i>Dennstedt;</i>	3	<i>Lati^liae</i> t • • • •	80; 29	<i>Rheede</i>	3
<i>Derris elliptica</i> Benth.	101	<i>Eeiolcbium</i> Benthk.	10, 31	<i>Eichard</i>	1
" <i>malaccensis</i> Prain	109	<i>Leptolobium</i> Vog.	5	<i>Eimosae</i> ^	37; 22, 28
" <i>marginata</i> Benth.	2, 109	<i>LonJiocarpus domingensis</i> DC.	1	<i>Hobinia</i>	5 1
" <i>pinnata</i> Lour.	12, 48, 70, 108	<i>Loureiro</i>	2	<i>Hoot of D. pinnata</i> chewed	48
" <i>pubinervis</i> Benth.	109	<i>Macápil</i>	43	<i>Kostratae</i> %	59; 28
" <i>robusta</i> Benth.	2, 109	<i>Madama</i>	77, 78	<i>Both.</i>	3
" <i>scandens</i> Benth.	2, 3, 4, 5, 10, 109	<i>Madama bin</i>	7 7	<i>Roxburgh</i>	1
" <i>thyriflora</i> Benth.	2, 109	<i>Malabaria</i>	16	<i>Eubiginosae</i> If	61; 28
" <i>tripliylla</i> Pers.	1	<i>Malay Peninsula</i>	1 5	<i>Salken</i> A dans	3, 10
" <i>uliginona</i> Benth.	1, 3, 10, 109	<i>Malaya</i>	15	<i>Selenolobium</i> §	5, 6, 7, 8
<i>Deserta, India</i>	1 2	<i>Medeloa</i>	90	<i>Semeionotis</i> Sehott	10, 3L
<i>Discolor</i> %	• 36, 26	<i>Menooides</i> %	63; 28	<i>Senaar Ebony</i>	4 7
<i>Distribution of species of Dal-</i>		<i>Millettia</i> W. & A.	4	<i>Sericeae</i> %	85; 29
<i>hergia</i>	H	" <i>pulchra</i> Kurz	109	<i>Shisham</i>	8 1
<i>Dom-chloeu-snuol</i>	107	" <i>sericea</i> W. & A.	109	<i>Sissoa (sub-gen.)</i>	32; 7, 8, 25
<i>Don, G</i>	4	<i>Mimosoides</i> f	47; 22, 27	<i>Sissoa</i> § • • • •	J, 6, 8
<i>Drakenstenia</i> Neck.	1 0, 31		25, 29	<i>Sissoo</i> t • • • •	56; 2
<i>dDrepanocarpus</i> Kmz.	• 7, 3L	<i>Miquel.</i>	5	<i>Sisu.</i>	58
" <i>Cumingii</i> Kurz	• 35	<i>Miscolobium</i> §	71; 9, 23, 24,	<i>Snuol.</i>	107
> <i>monospermus</i> Kurz	64	<i>Afiscolobium</i> Vog.	10, 31	<i>Solori</i> Adans	3, 10
5, <i>reniforwis</i> Kurz	105	<i>Moluccas.</i>	15	<i>Sophora japonica</i> Linn.	109
j> <i>spinus</i> Kurz	36	<i>Mucwia</i> Adans.	1 1	<i>South-Eastern Asia, Botanical</i>	
<i>Eastern China</i>	1 4	<i>Name Dalbergia, origin of the</i>	1	<i>provinces of</i>	1 2
" <i>Indo-China</i>	1 8	" " <i>validity of the</i>	10	<i>South-Western China</i>	IS
<i>Ecastaphyllum</i> P. Br.	0 1, 5, 6, 8,	<i>New Caledonia</i>	1 1	<i>Sprengel</i>	3
	10, 31	" <i>Guinea</i>	1 5	<i>Stillingia sebifera</i> Michx	53
7- <i>Albert isii</i> Prain	33	<i>Nimmo</i> • • • •	4	<i>Stipulaceae</i> If	101 30

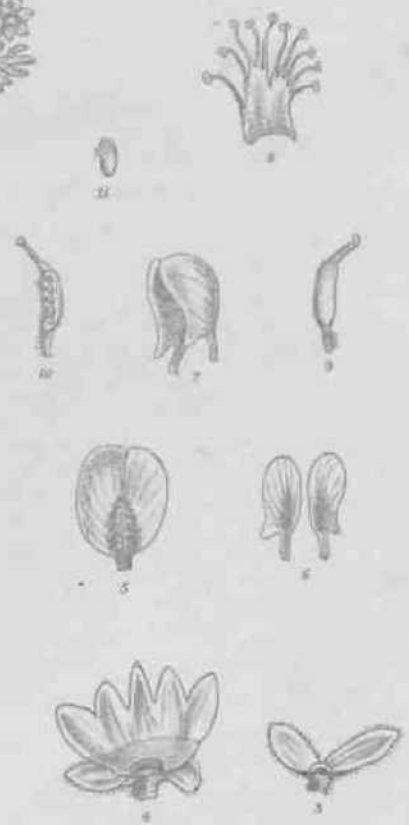
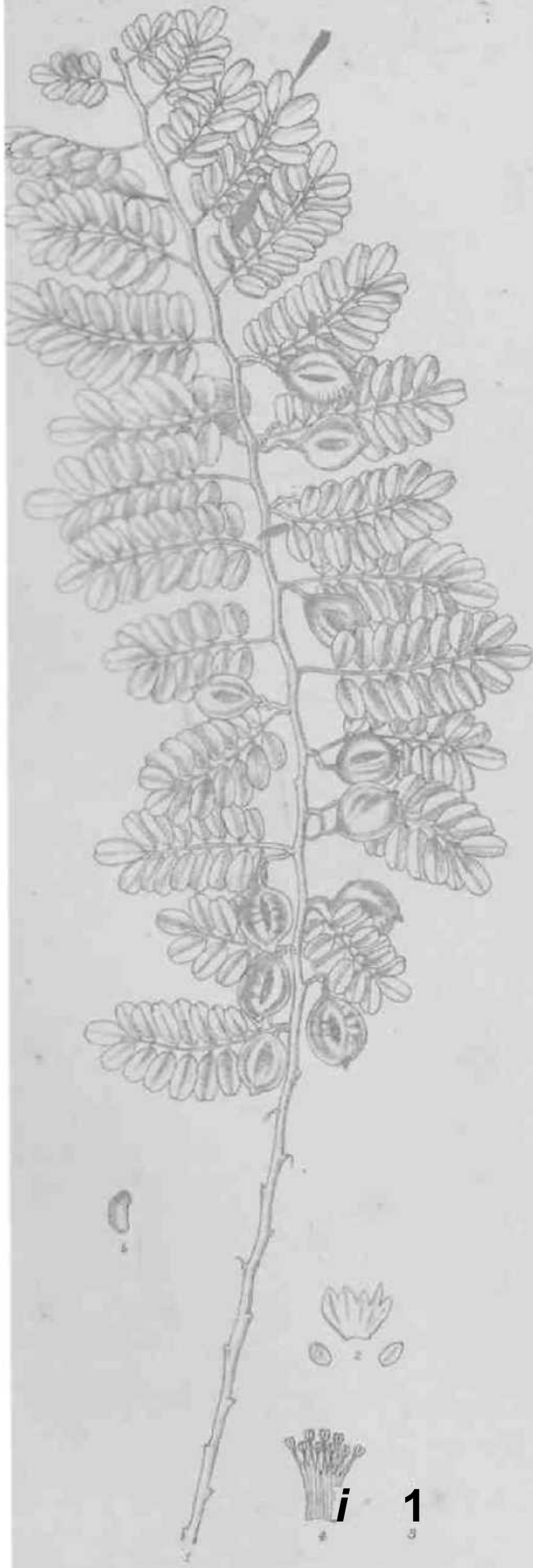
<i>Sizololium</i> V. Br.	11	Tiiitpob, Thitpot	98	<i>Triptolemea</i> Mart.	5, 10, 51
Subareas of China, botanical.	13	Timber of <i>D. assamica</i>	90	Validity of the name <i>Dalbergia</i>	10
„ India, „	12	„ <i>cambodiana</i>	79	Vavau	11
„ Indo-china, „	12	„ <i>cochin chinensis</i>	83	Velutinae ^	74; 29
„ Malaya, „	15	„ <i>Uemsleyi</i>	95	Ventenat	1
„ Papuasia, „	15	„ <i>hyoena</i>	89	Volubiles •[.	99; 30
Sumatra	36	„ <i>laccifera</i>	107	Wallich	4
Tabouk ben	94	„ <i>latifolia</i>	82	Walker-Arnot	4
T a karg-km-ten	61	„ <i>Oliveri</i>	93	Western Indo-China >	17
Tamalan	93	„ <i>ovata</i>	78	Wight	4, 5
Tán	89	„ <i>paniculata</i>	107	Wilayati Shisham	81
Tan-mou-chou	69	„ <i>sacerdotum</i>	86	Willdenow	1
Tapoelandang	91	„ <i>Sissoo</i>	68	<i>Wistaria japonica</i> Sieb. & Zucc.	109
Tapouk pen	93	Toda cotly morum	94	Xem quát	88
Taubert	7	Tongkin^	12	Xnoul	88, 95
Tchan-keou	89	Trác	83	Yendiké	56
Te-zu	86	Tra-bnuno,	79	<i>Zoophthalmum</i> P. Br.	11
Thit-hsonfc-yo	78	<i>Triptolemea</i> § 32; 6, 8, 9, 22, 23, 25, 25			



m

f.jt





A. L. Singh.

A. DALBERGIA BECCAIOT Prain.

B. DALBERGIA. GLOMERATIFLORA K.

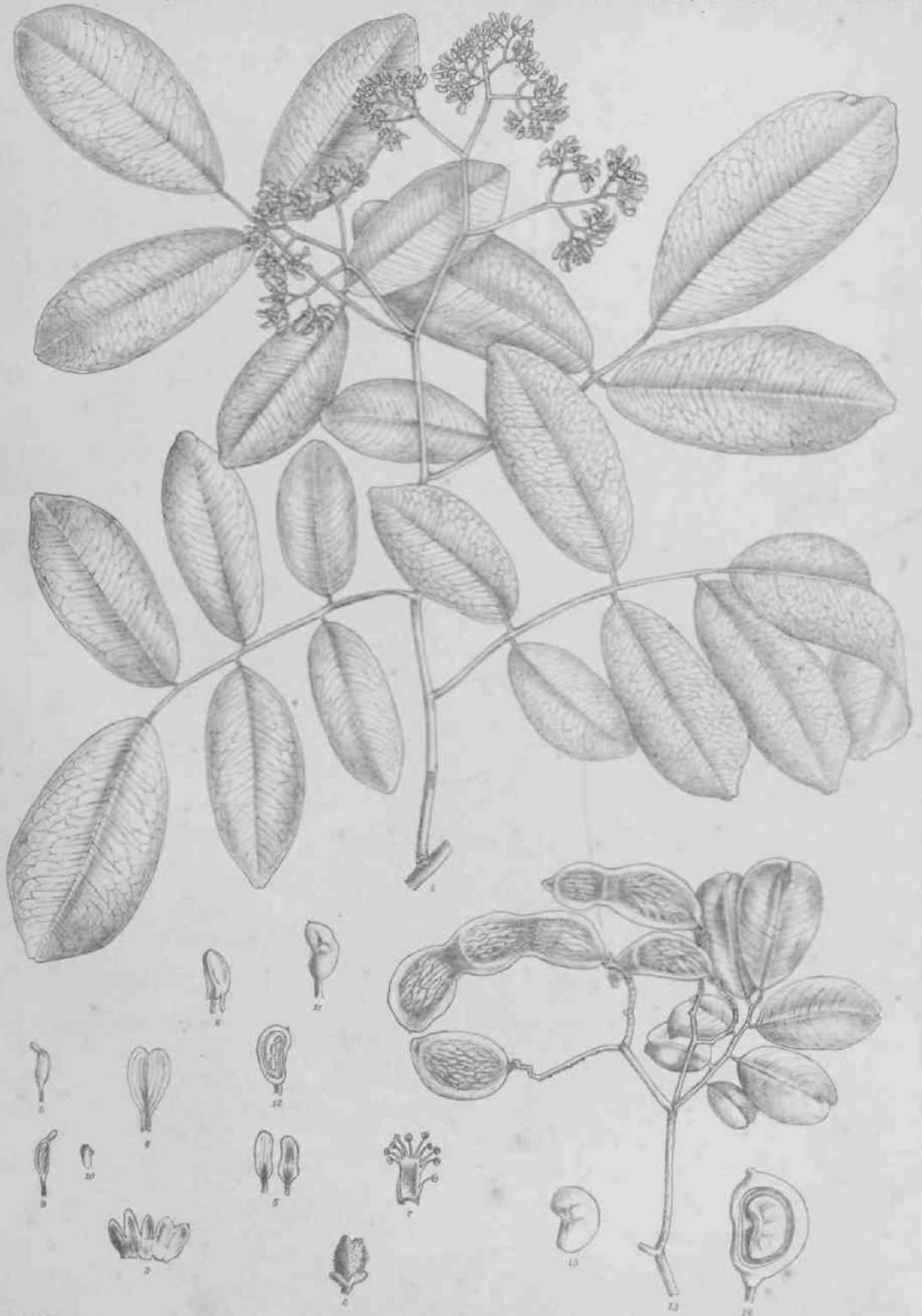
Illustrated by A. C. Singh.



Drawn by E. J. Kane

DALBERGIA CUMINGIANA Benth.

Leaf by A. C. Sargent



Drawn by K.P. Dass.

DALBERGIA PARVIFLORA Roxb.

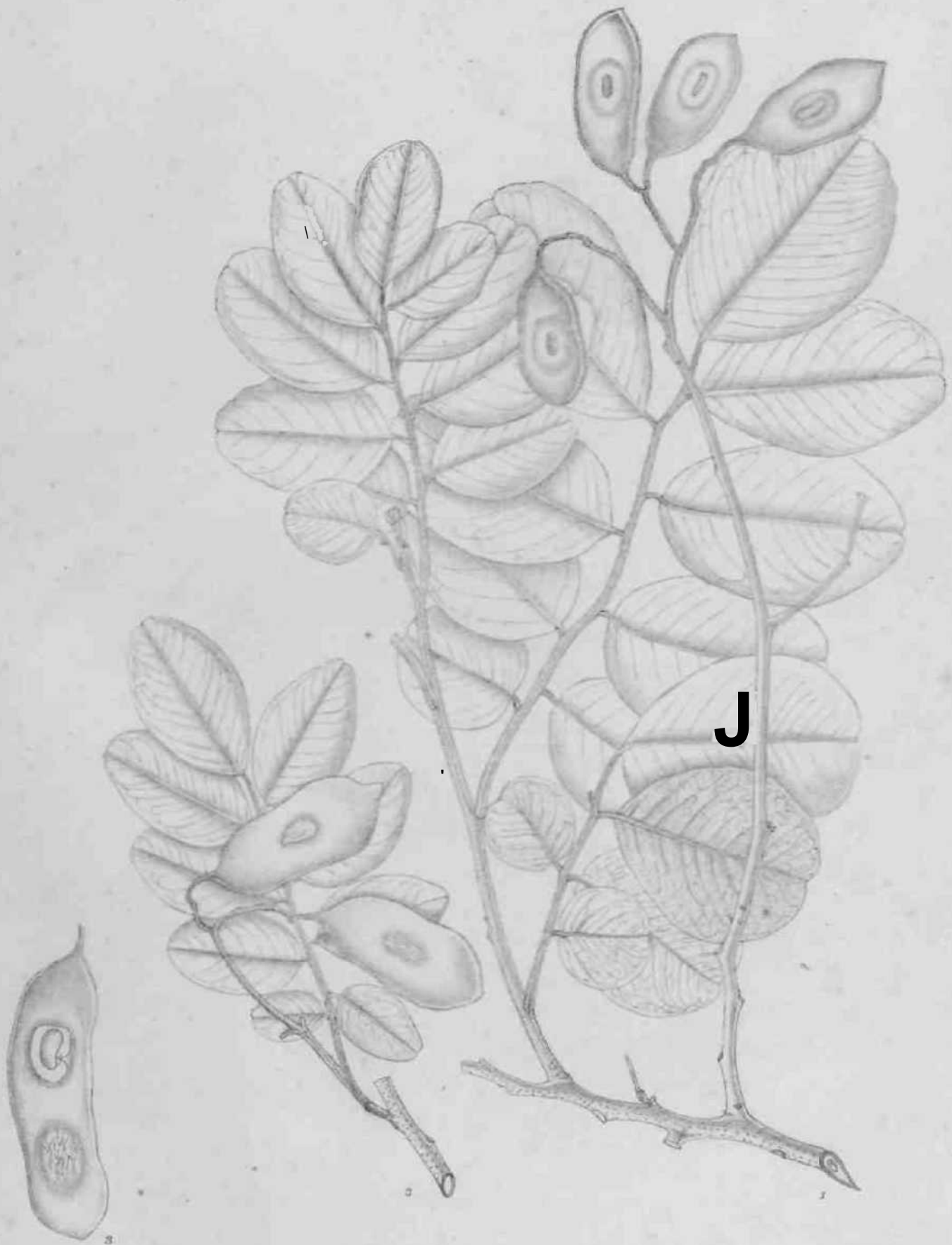
Colo. by K.P. Dass.



Drawn by KP Cass

DALBERGIA SPINOSA, Roxb.

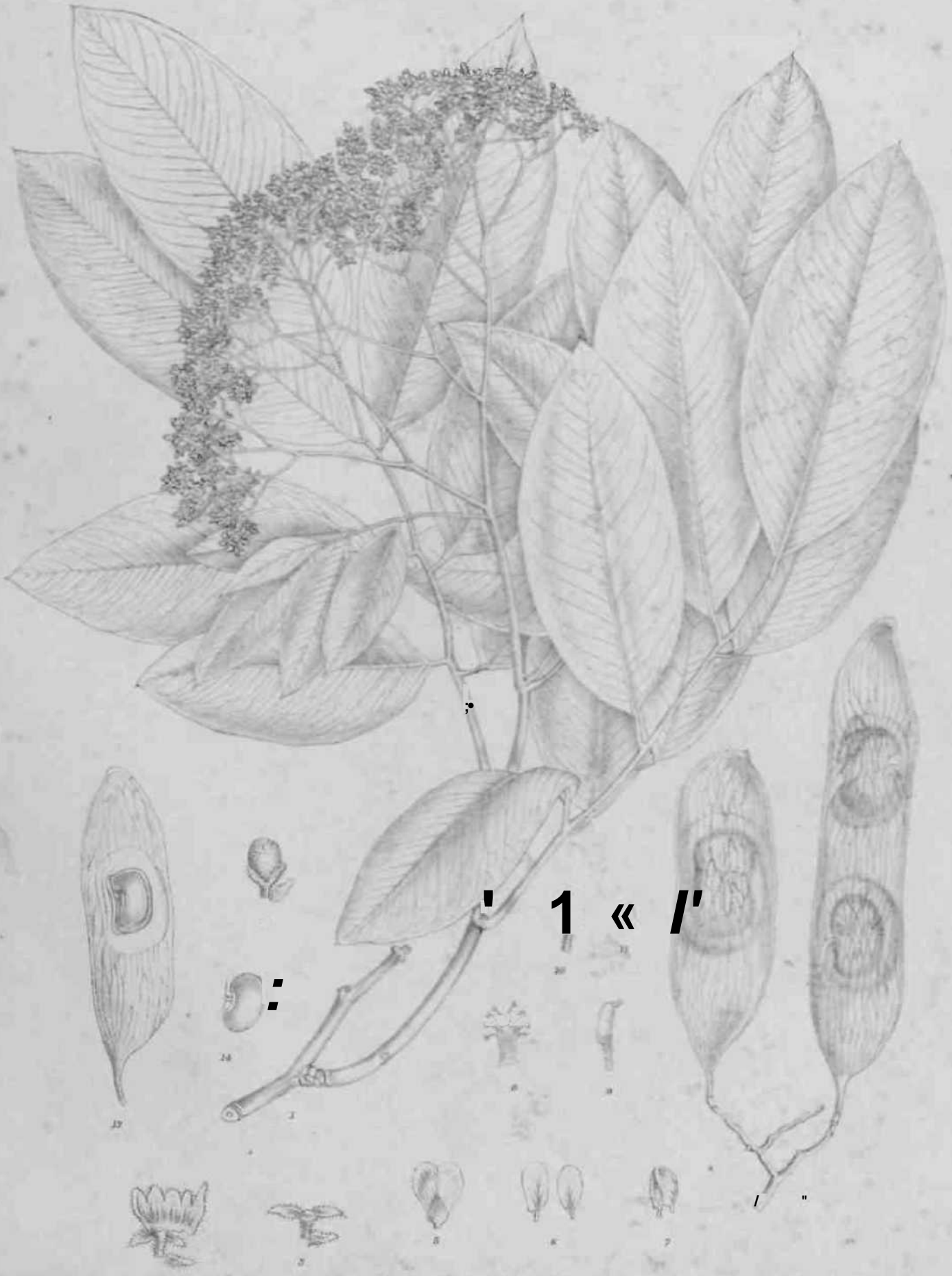
Lith. by



Drawn by Q. H. G. B. Dhury

DALBERGIA SISOO, m.

litli :-y Citra Sila C9

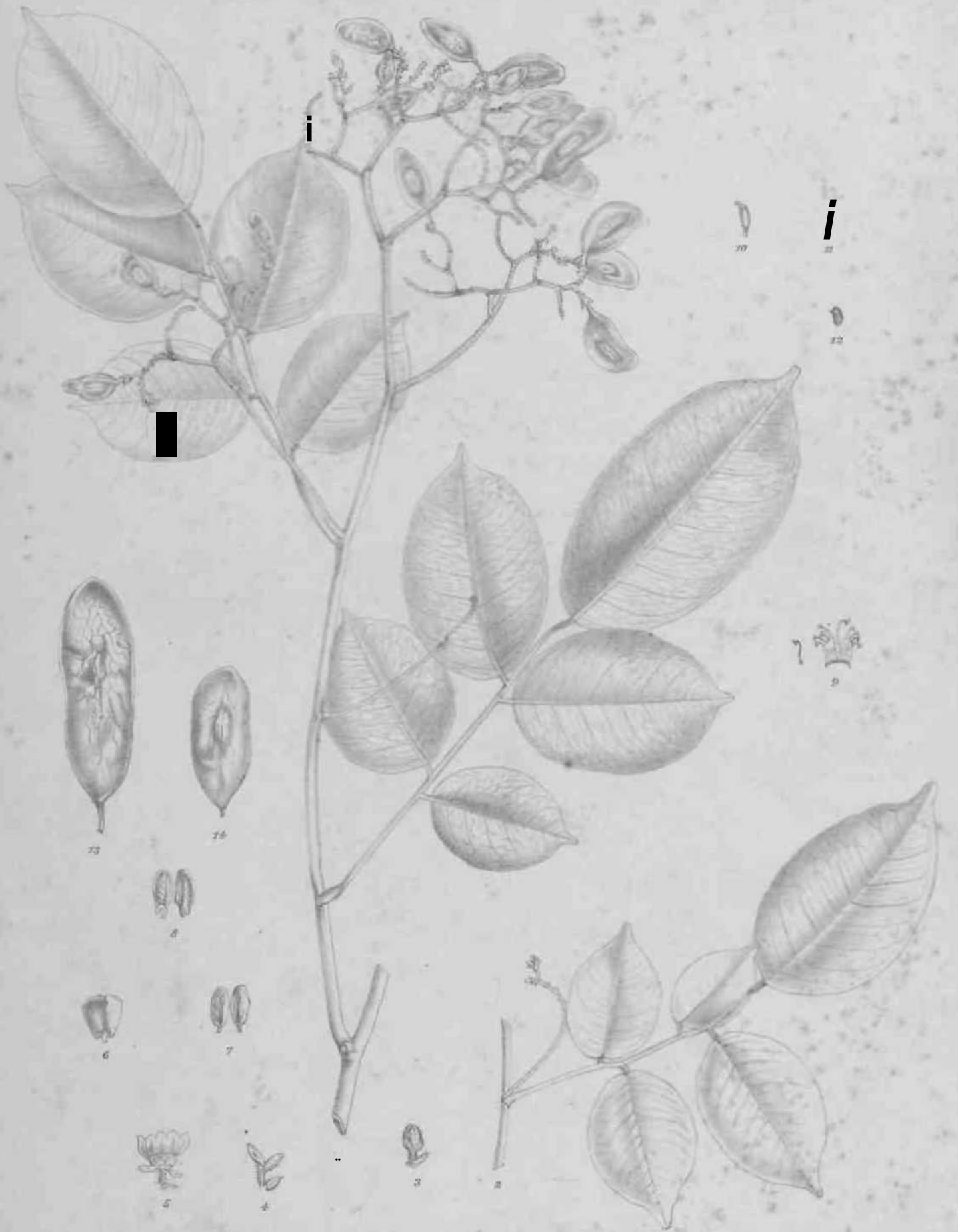


Drawn by K.P. Dass.

DALBERGIA EUOCOSA Roxb.

Lith. by Chitra Silp. Co.





Drawn by K.P. Dass

DALBERGIA FORBESII Fram

Lith. by Chitra S. Co.



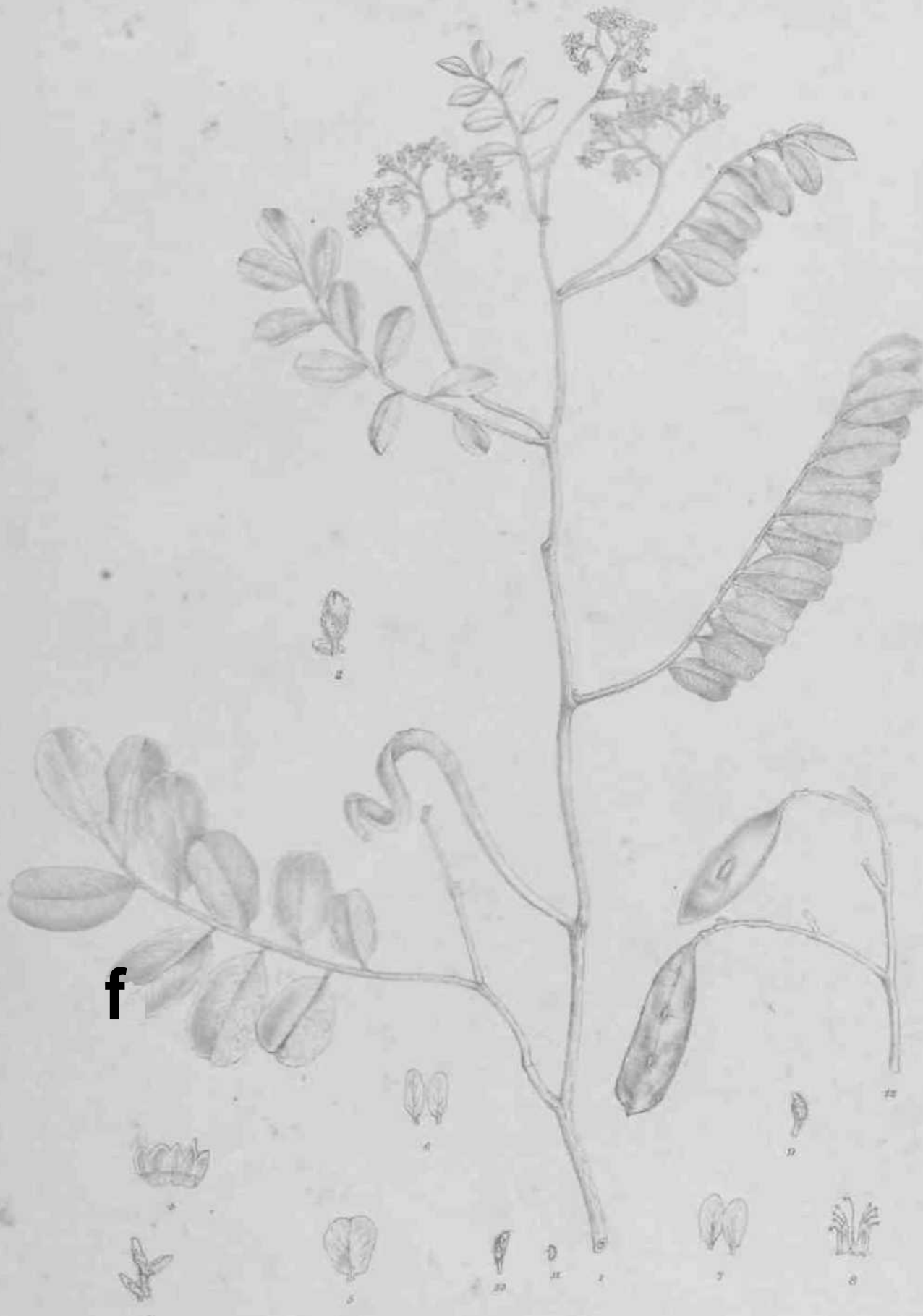
0



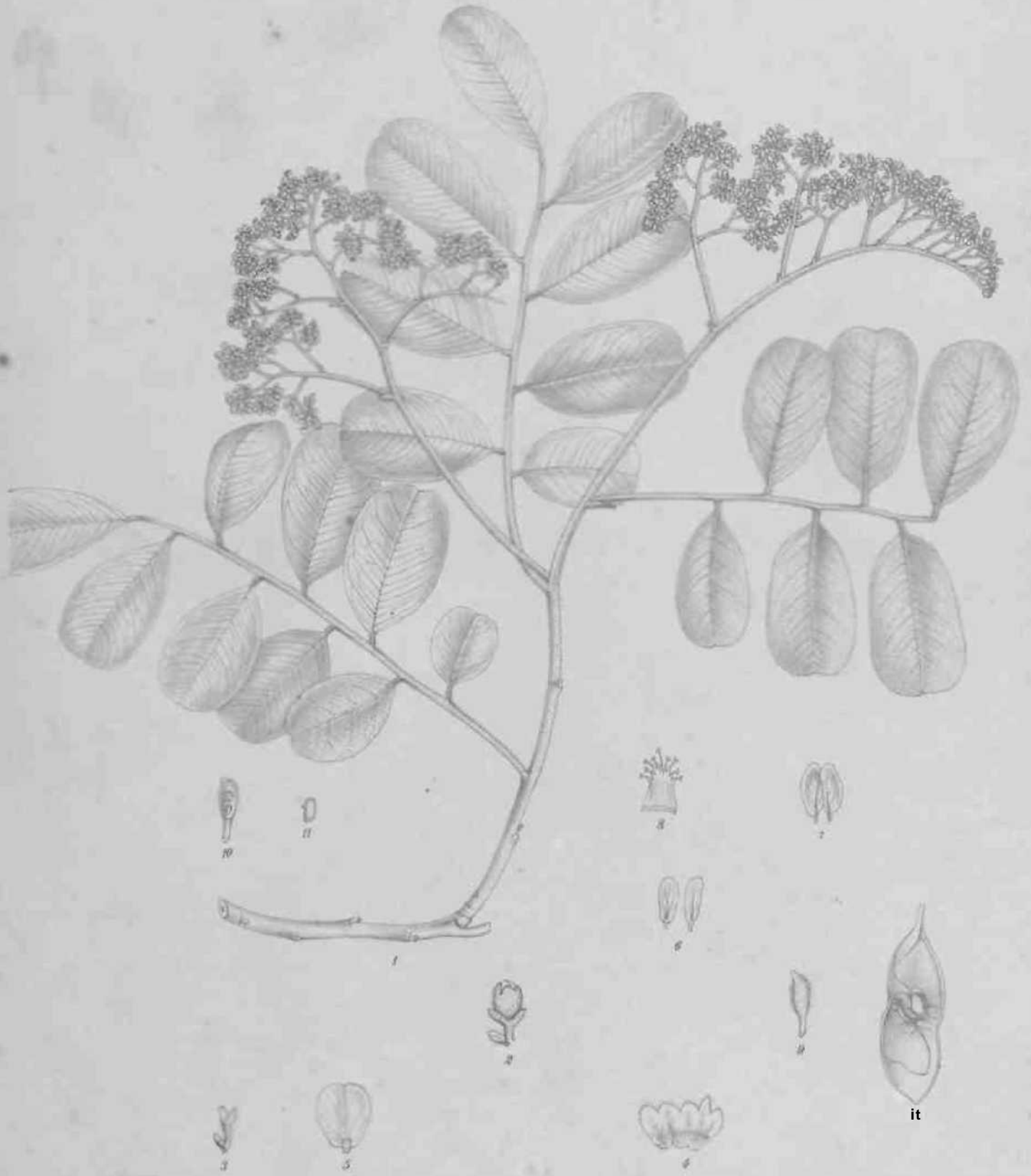
Drawn by A. I. Singh

Label by Choro Sipa CB

DALBERGIA JUNGHUHNII Benth.



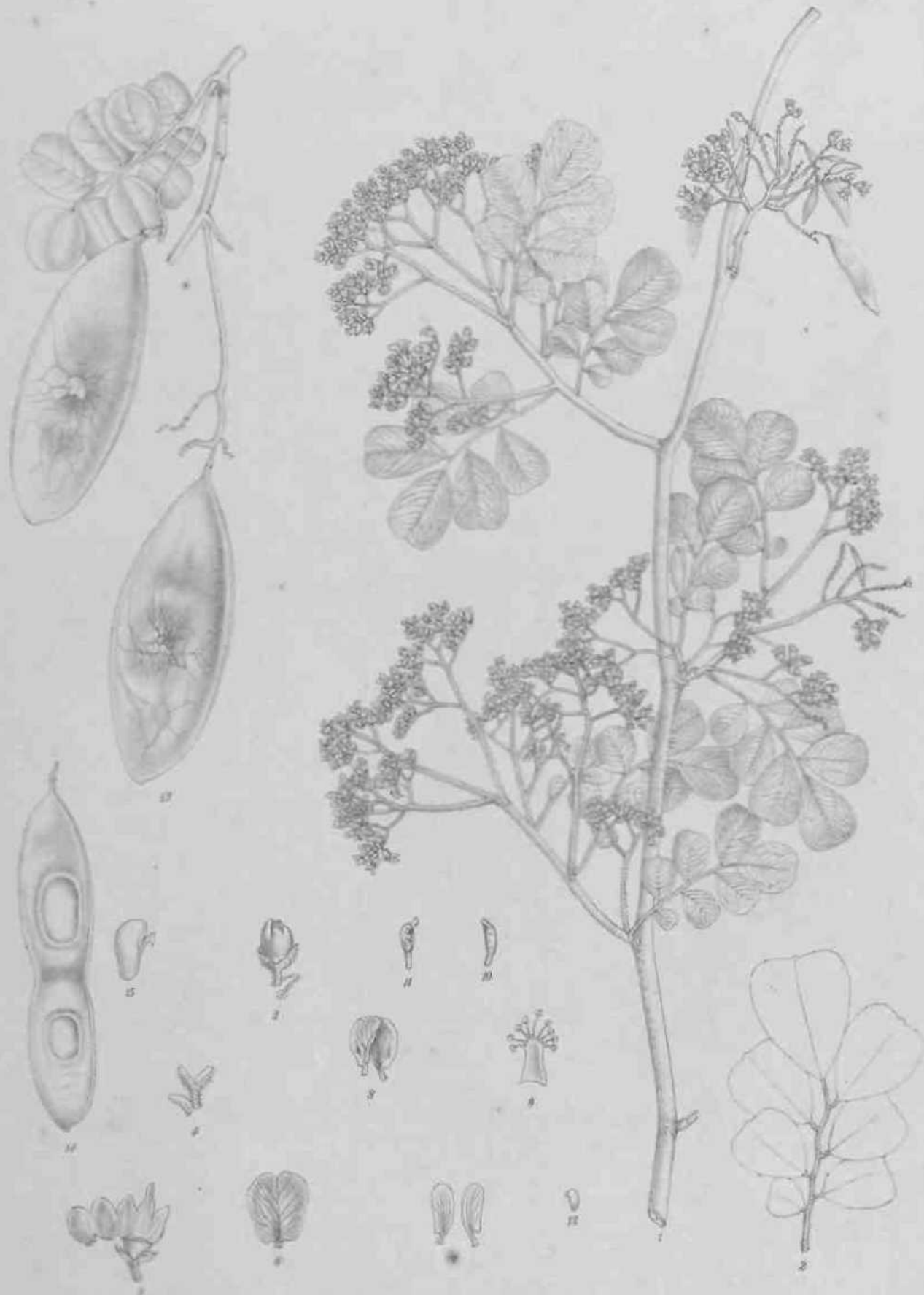
f



Drawn by K. P. Donn.

DALBERGIA CURATILIS Prain.

Lith. by yC.ll.mdvJ



Drawn by E.P. Dunn

GALEEGIA STERCORACEA Maing.

Lith. iii/ S.C. Mordal.



Drawn by X. E. Dore.

DALBERGIA MULTIFLORA Hayne.

Lith. by A. G. Choudhury.





Drawn by A. J. Mollo.

DALBERGIA PHYLLANTHOIDES Bl. var. BRNKOIUES Pi-ata.

Ji-n. bf A.C Chowdhary.





Mi

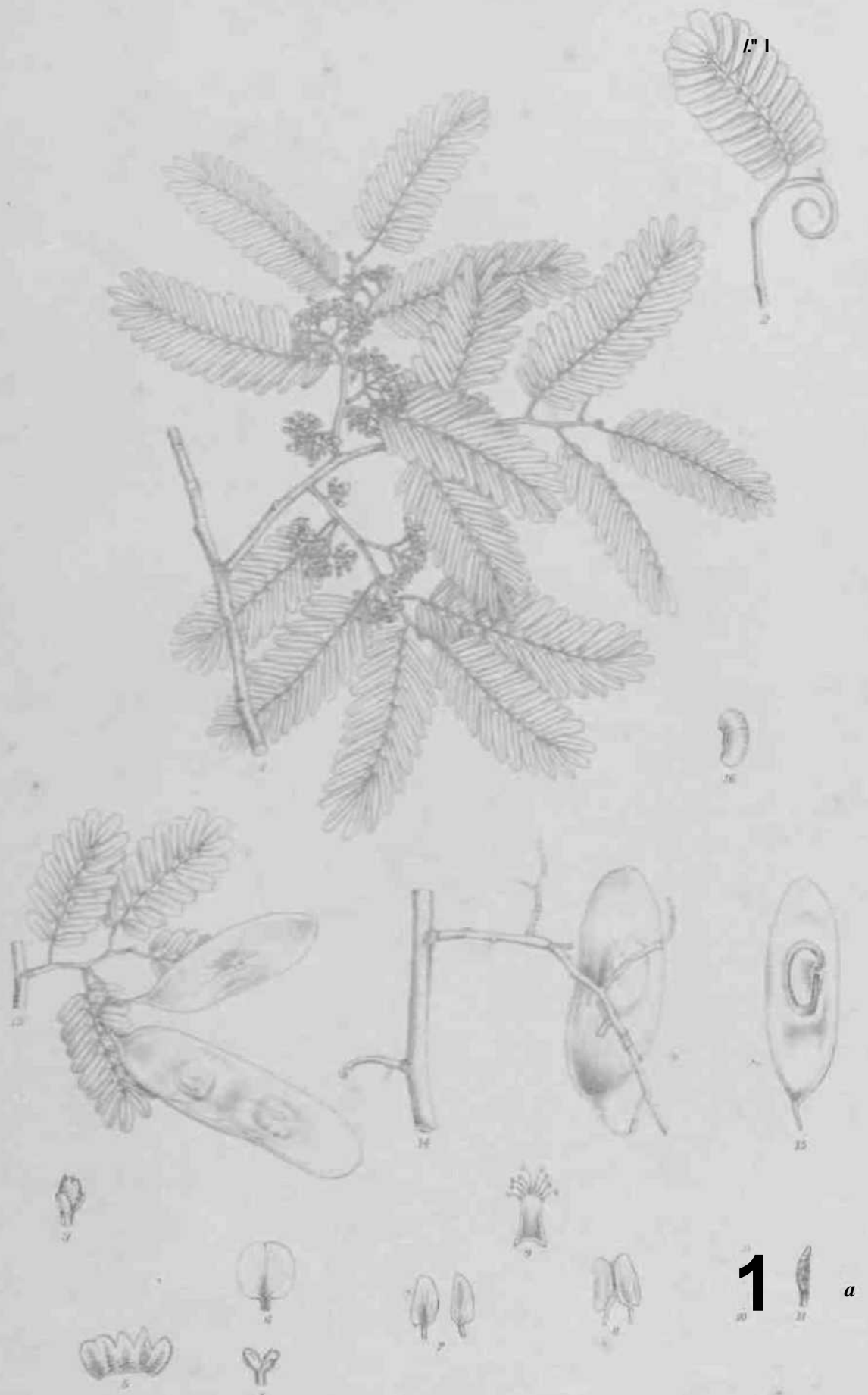
Tti

J

Drawn by A. L. Singh.

DALBERGIA MELANOXYLON Guill. & Perr.

Litho by K. D. Chandra.





Drawn by K. P. Das.

DALBERGIA STEMPHYLLA Prwn.

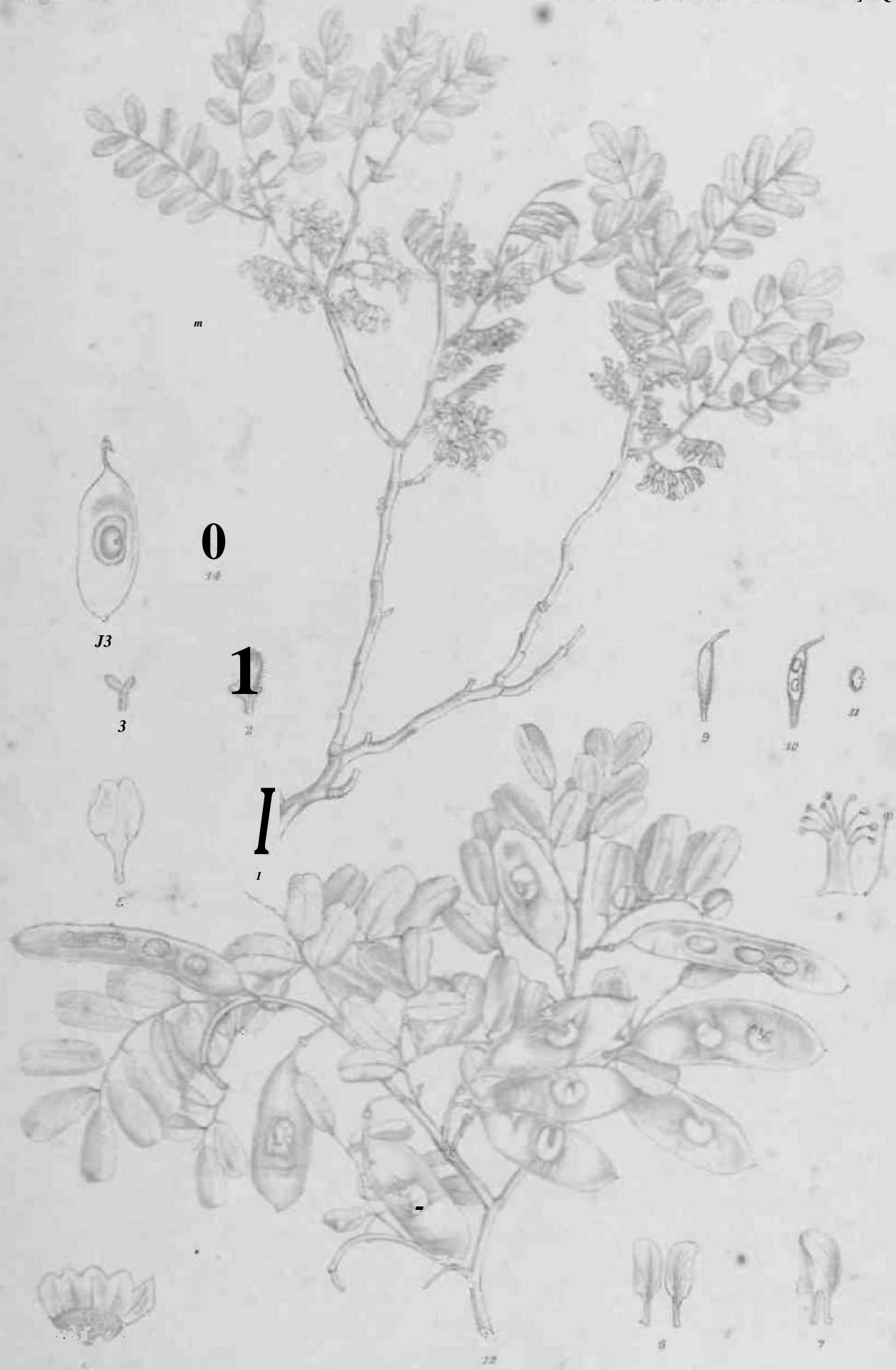
Lith. by K. D. Chandra.



Drawn by K.P. Dass.

DALBERGIA MIMOSOIDES Franch.

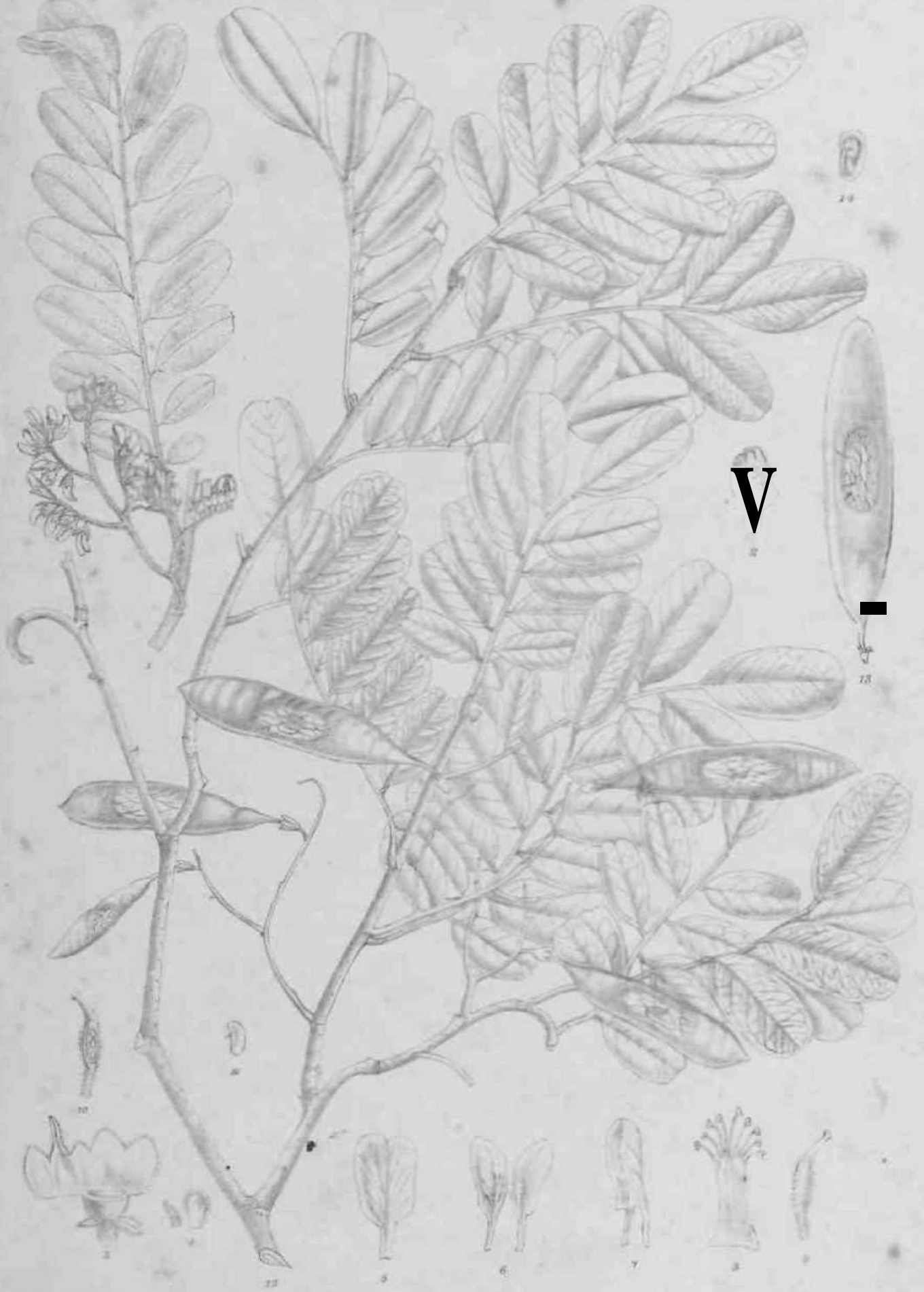
L. 22. 5. K.P. Dass.



DALBERGIA HANCEI Benth.

Drawn by K. P. Das

Lith by Chitra Srip G



Drawn by A. D. Mills

DALBERGIA DYERIANA Frax.

Lib. by Chas. H. P. O.



V E

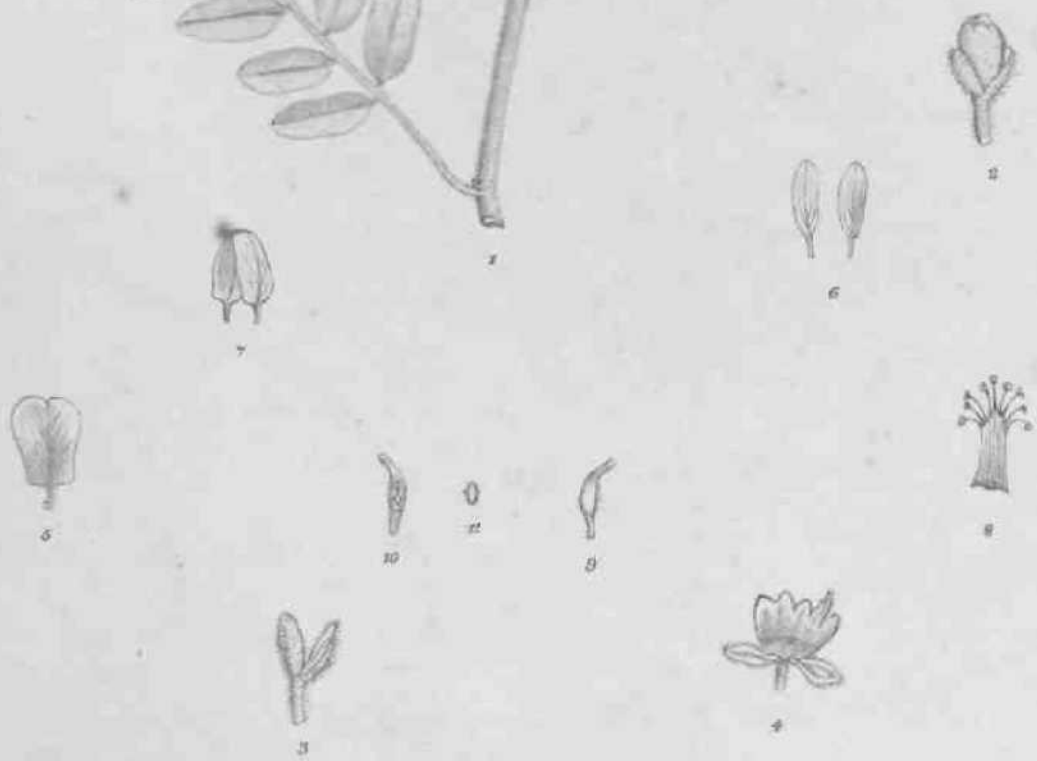
-v r



Drawn by M.P. Das.

DALBERGIA YUNNANENSIS 51S rYanub-

Lith. by K.P. Das.



Drawn by K. P. Dass.

DALBERGIA COLLITTI Prain.

Litho by C. S. Chatterjee.



Drawn by A. D. Mollis.

Engr. by Chitra Saha C.S.

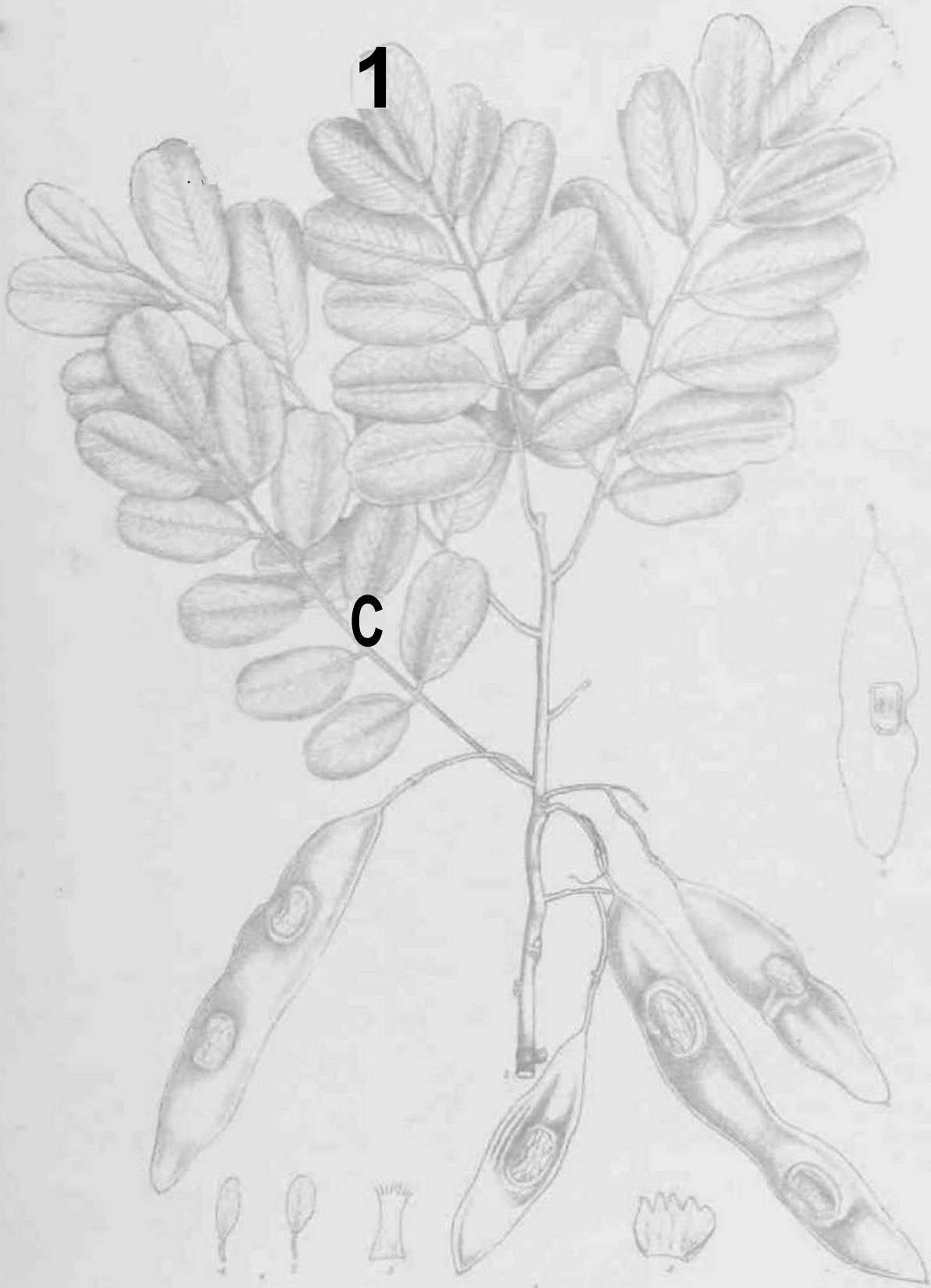
DALBERGIA FOLIACEA Willd.

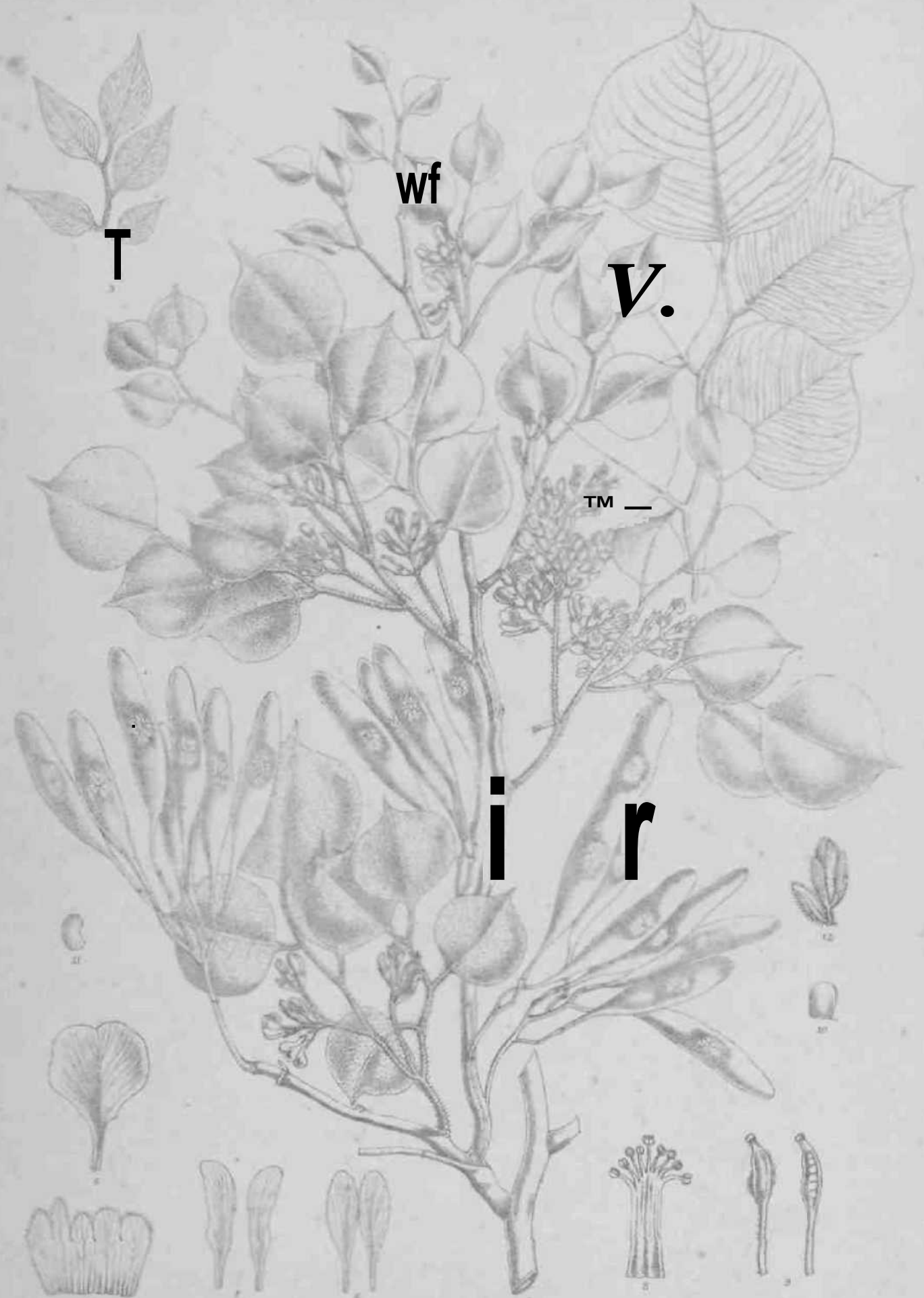


Drawn by N. P. Datta

DALBERGIA CULTRATA. Griseb.

Lith. by A. C. Sengha





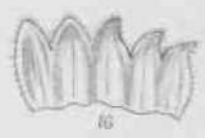
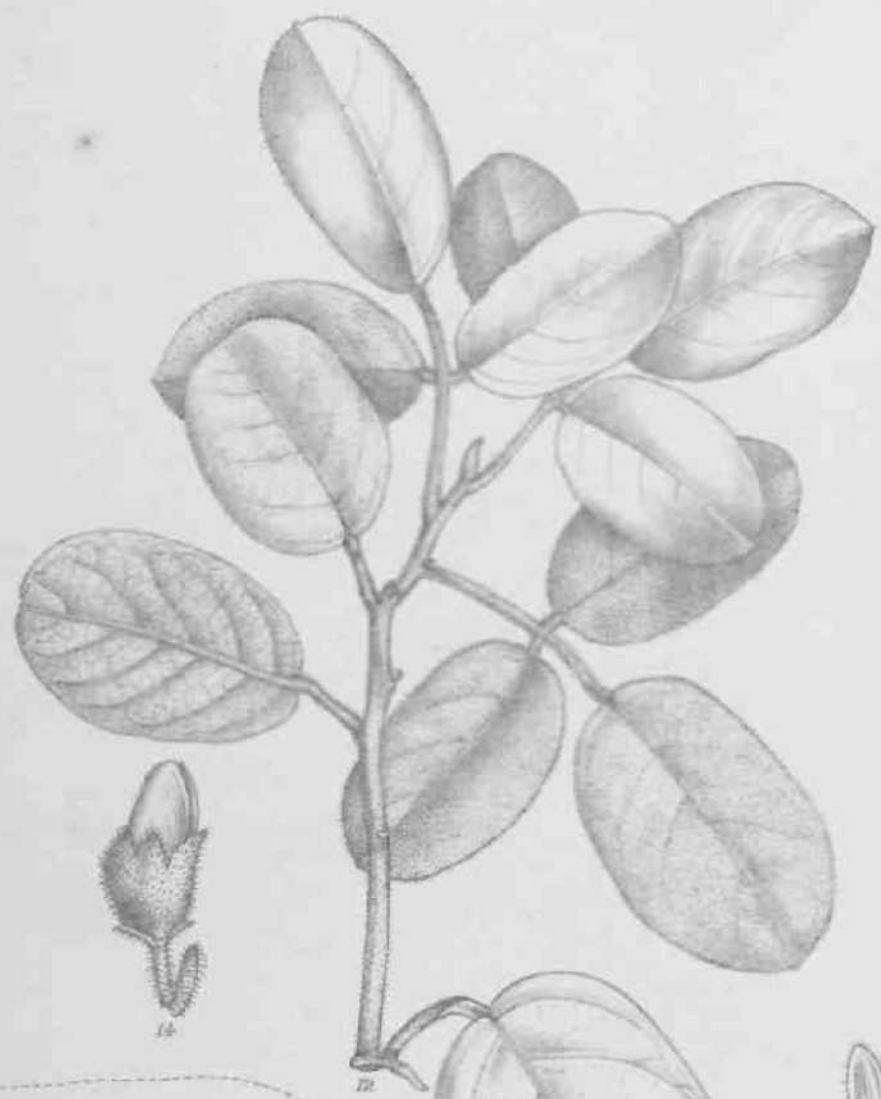
wf

T

V.

TM —

ir

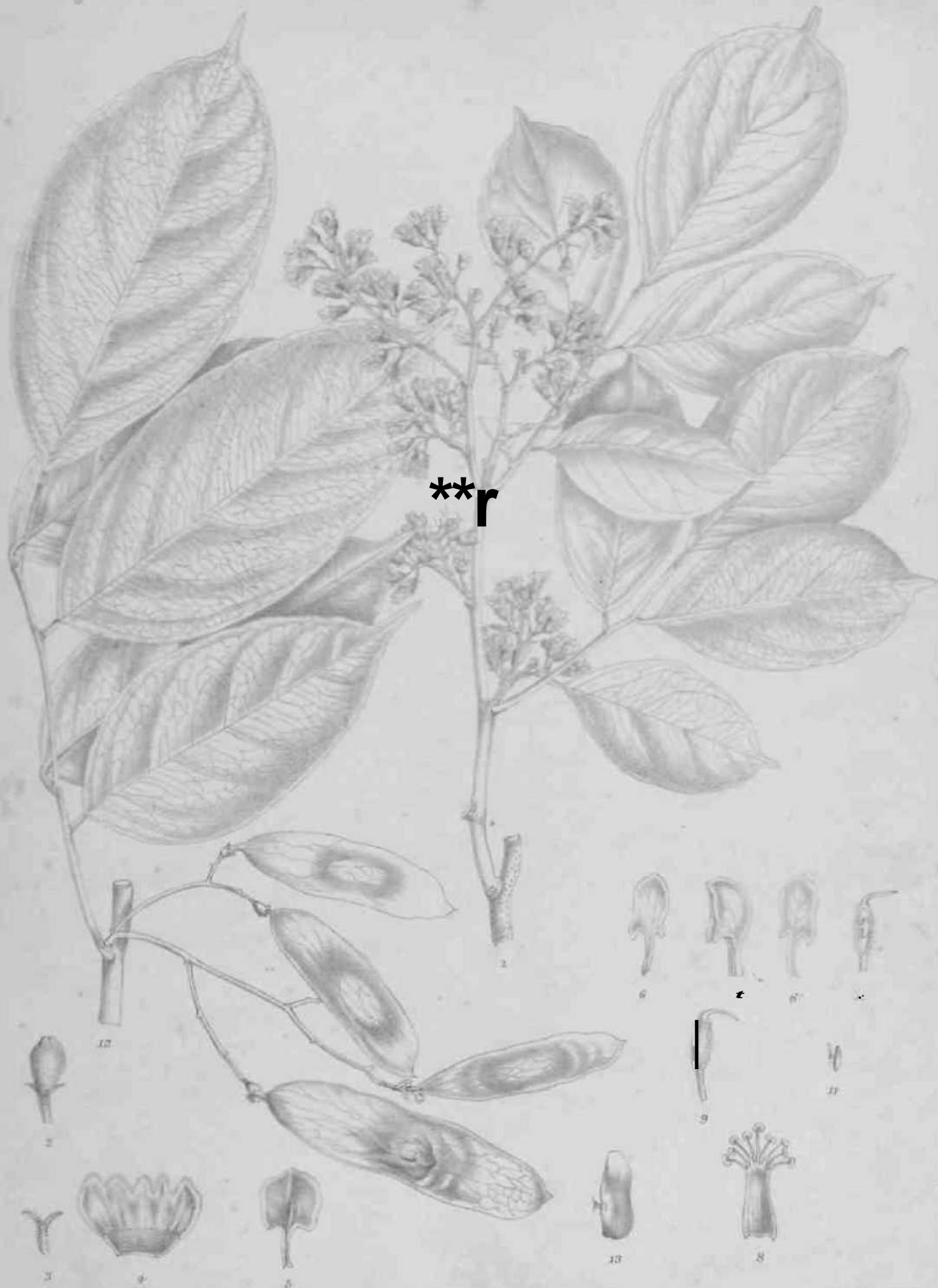


Drawn by K.P.D. lit*

A. DALBERGIA HULLETTII Prain.

Lith. by K.P.I. m»»

B. D. UBERGIA HAVILANDI Prain.



**r

Drawn by K. P. Doss.

DALBERGIA ^aSTRATA Grah.

Enl. by G. S. S. Co.



Drawn by A. S. Mills

Lith. by James Edger C

DALBERGIA KINGIANA Irwin



Drawn by K.R. Das

DALBERGIA HENRYANA. Prain.

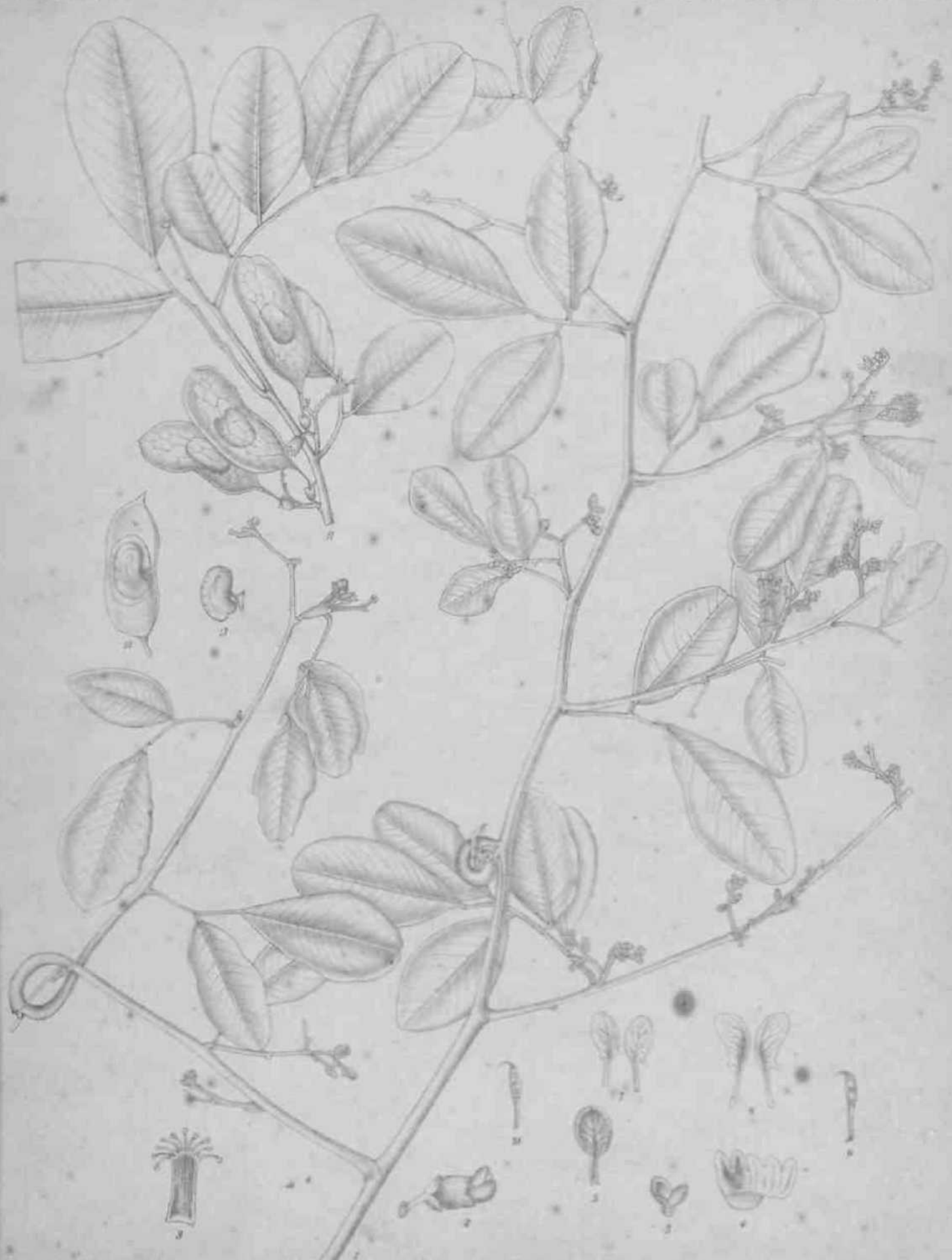
Letts by A. N. Sanyal



Drawn by E. F. Dhan.

DALBERGIA BENTHAMII FRAX.

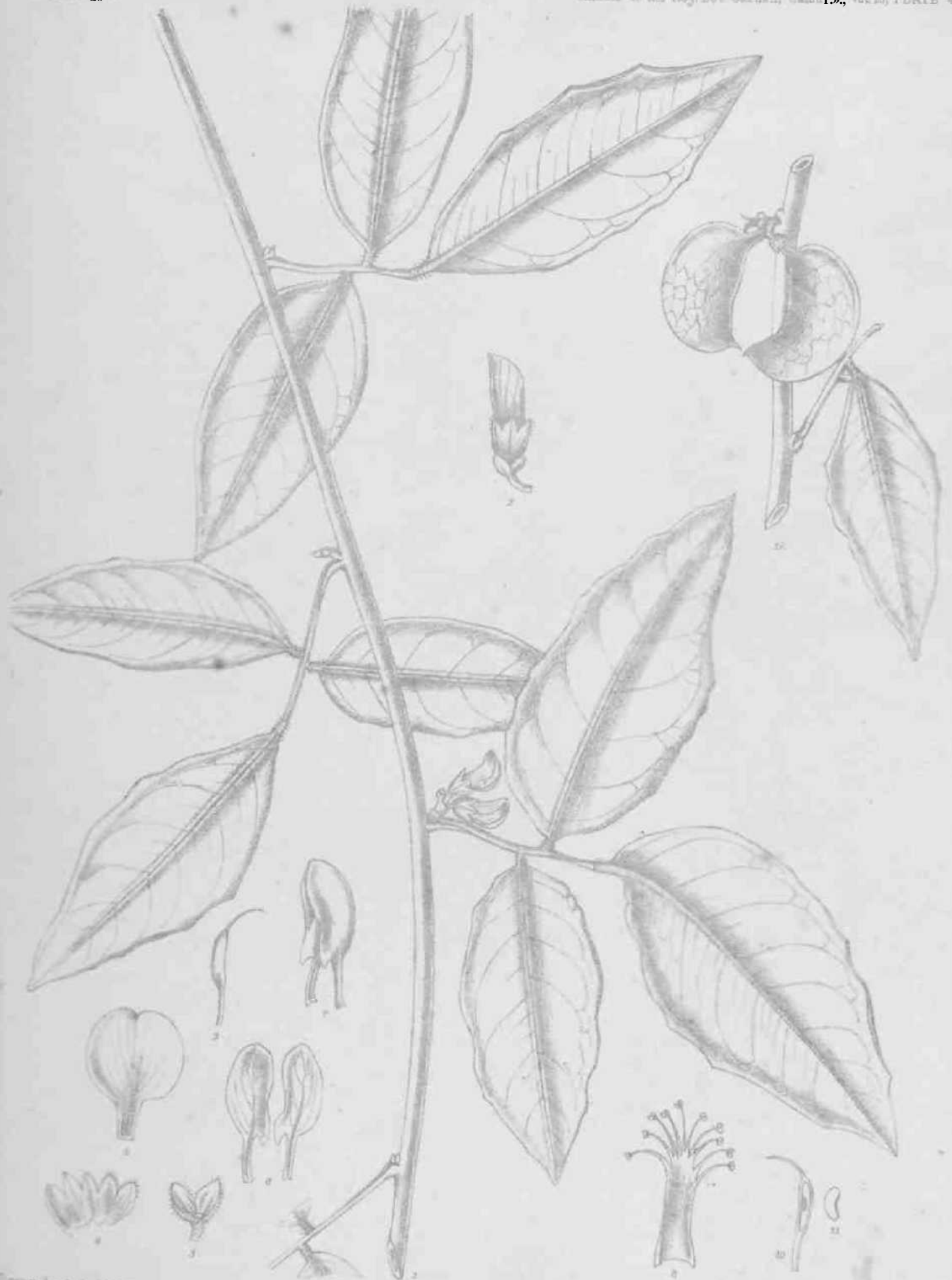
with fig. 4 G. Clouston.



Drawn by A. L. Singh

DALBERGIA BUERGERI Roxb.

Lith. by B. S. Mandal



Drawn by A. I. Smith.

DALBERGIA MENZIESII Prain.

Litho by H. F. Dore.



Drawn by E. H. Clouston

DALBERGIA TORTA. Grah.

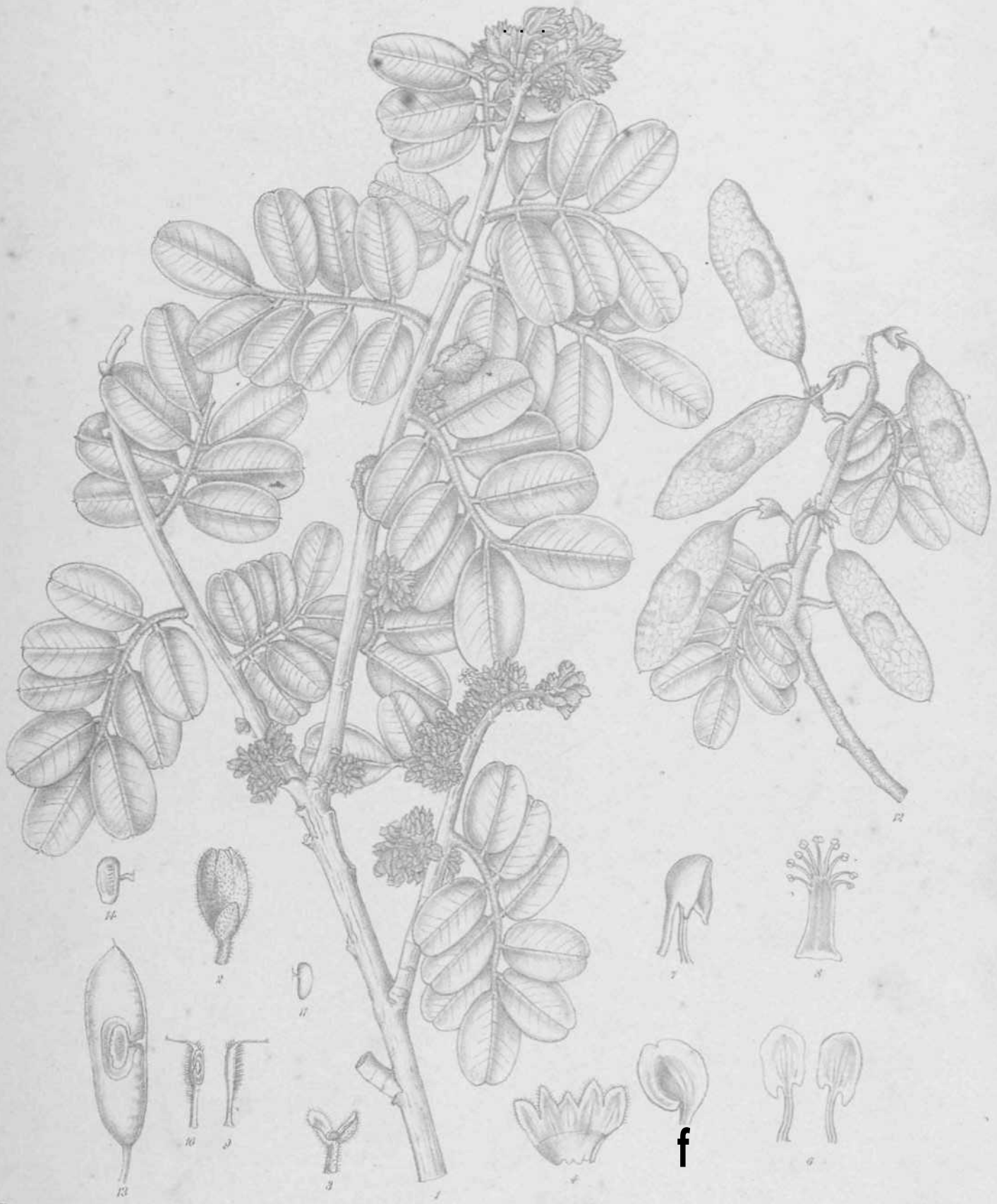
Engr. by E. P. Dorr.



Drawn by A. D. Mollis.

DALBERGIA CONGESTA Griseb.

Lith. by A. G. Chouh. - irjn

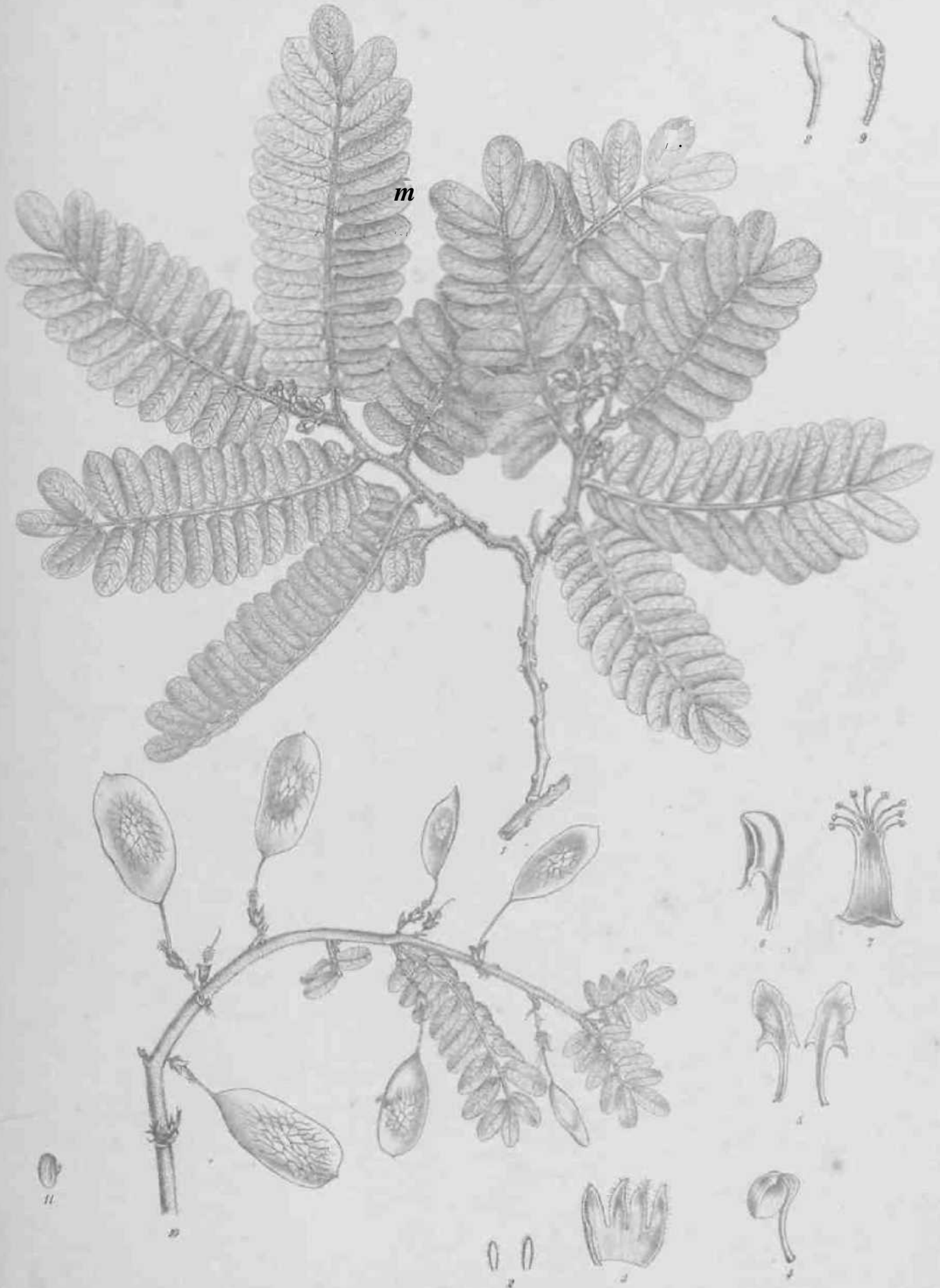


Drawn by A. S. Singh.

DALBERGIA SAHNJEBIANA Enth.

Lith. by G. Choudhury.

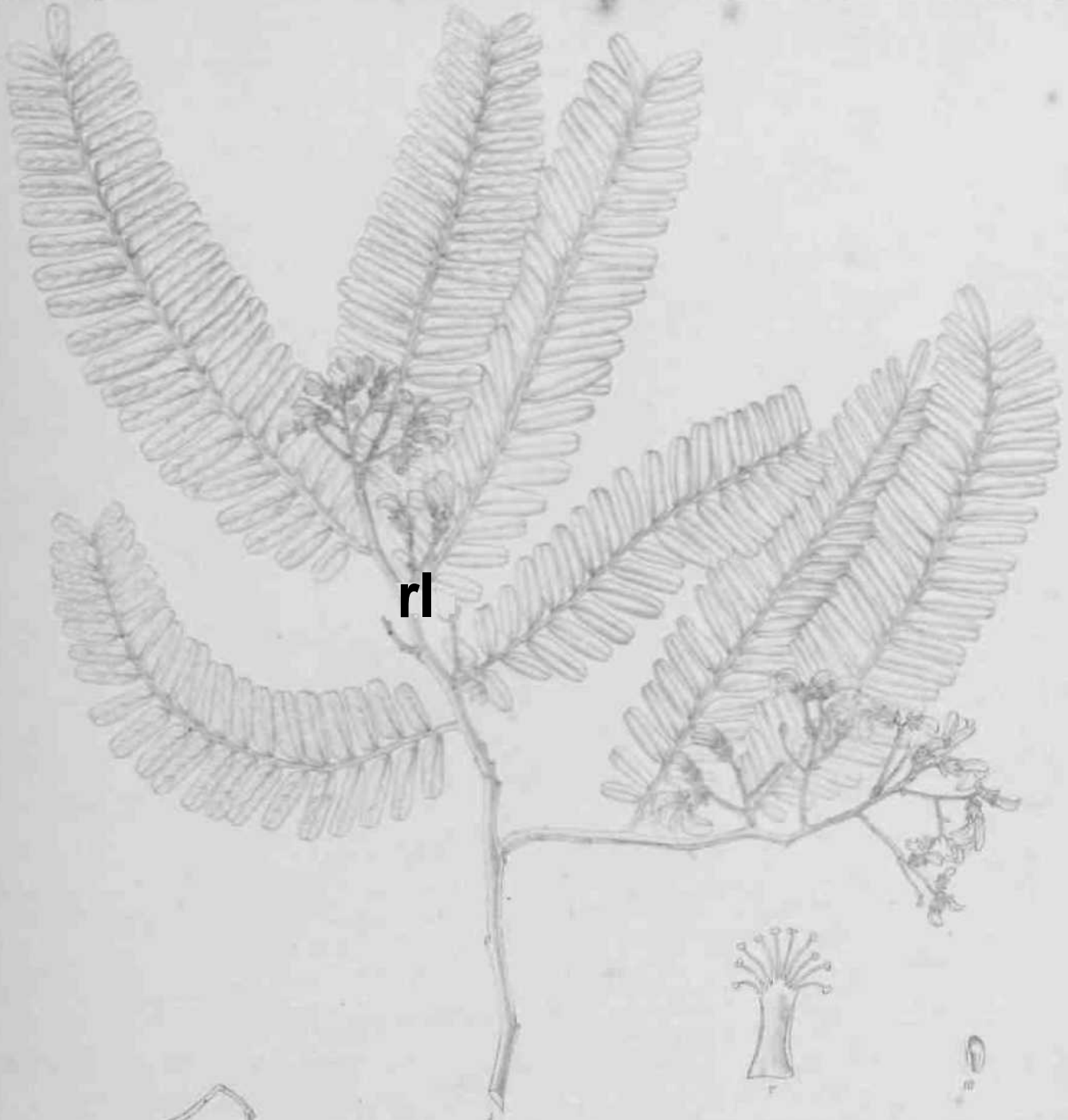




Illustrated by K. P. Datta

DALBERGIA MALABARICA Prain.

Written by S. G. Mendel.



ri



11



12



13



14



15



16



17



18



*

Drawn by K. F. Buse.

Lith. by K. D. Chandra.

DALBERGIA TAMARINDIFOLIA Po & J.



Drawn by R.P. ...

DALBERGIA POLYPHYLLA Be-ffc

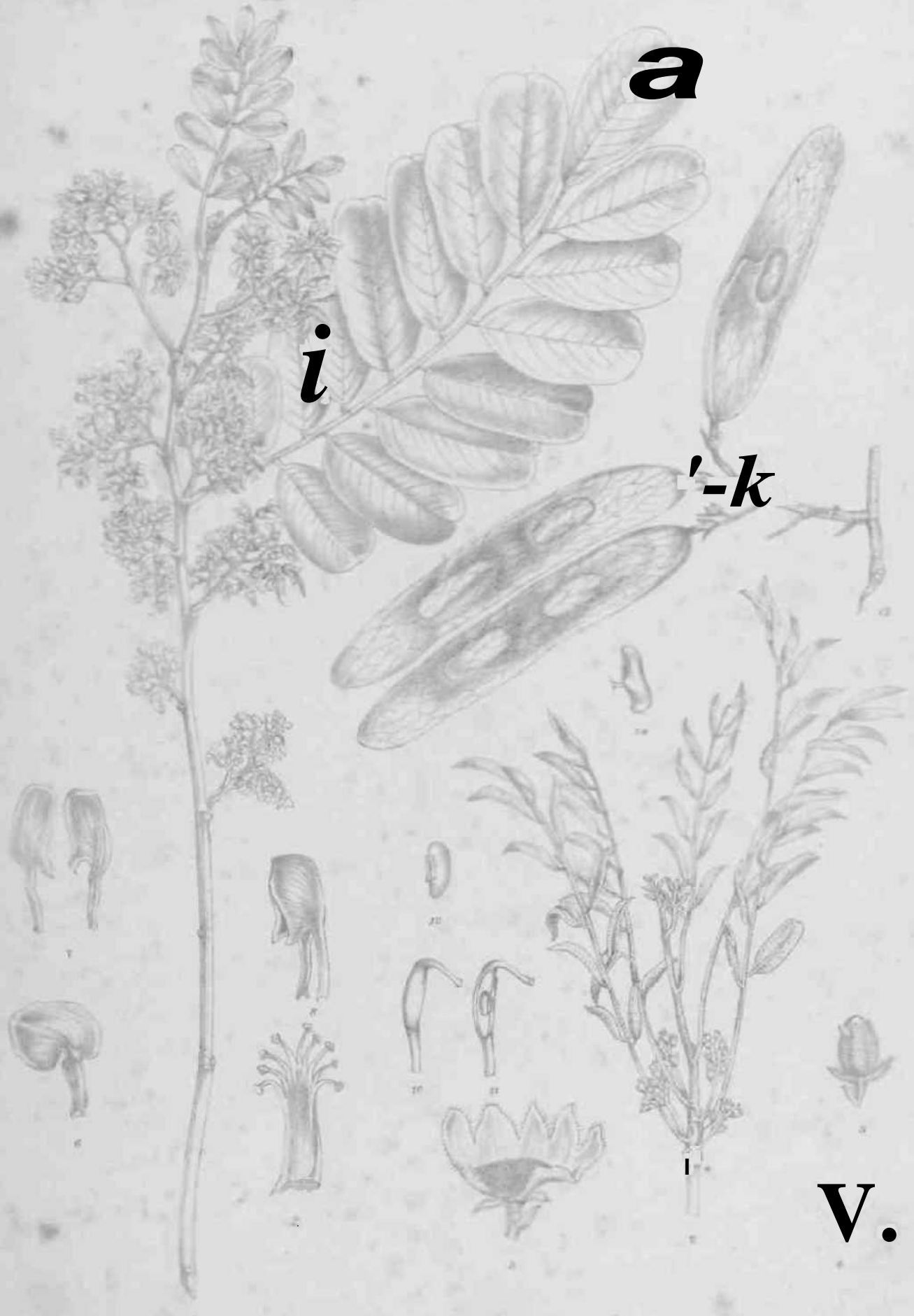
Lit), by Chitra Saha, CF



Drawn by A. D. Moll.

DALBERGIA JAKERII Buerck.

Engr. by Chitra Saha C.

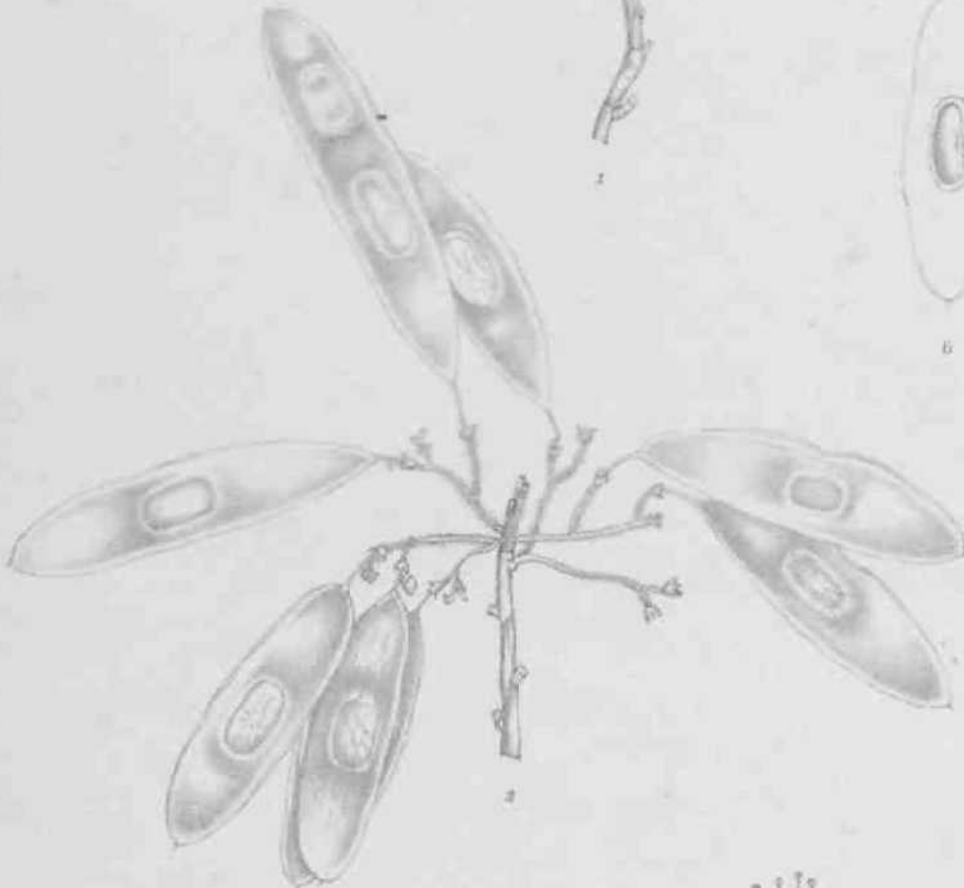
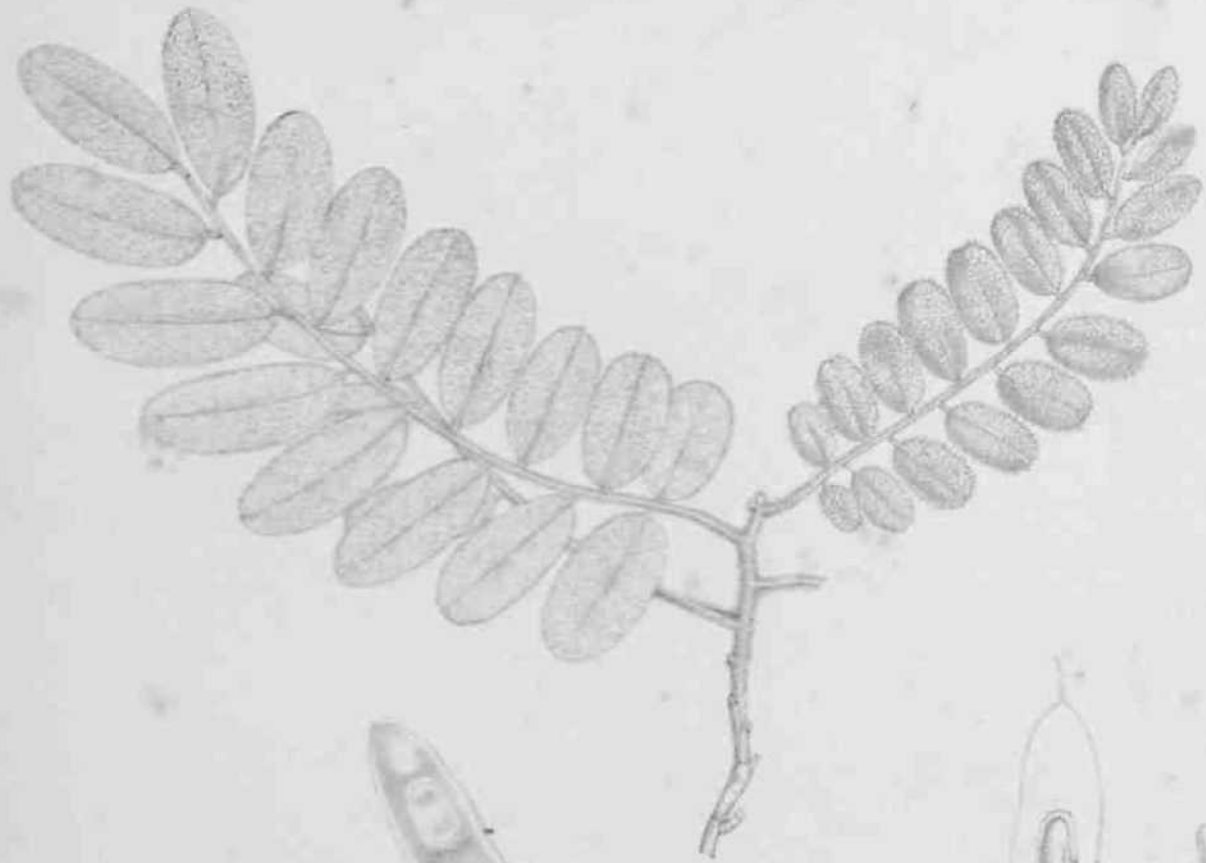


a

i

k

v.



Drawn by K. F. Dawe

EALBERGIA PIERREANA Prain.

[111];1. China. No. 61



Drawn by tf* DARR.

DALUERGIA DEN5A Scntl

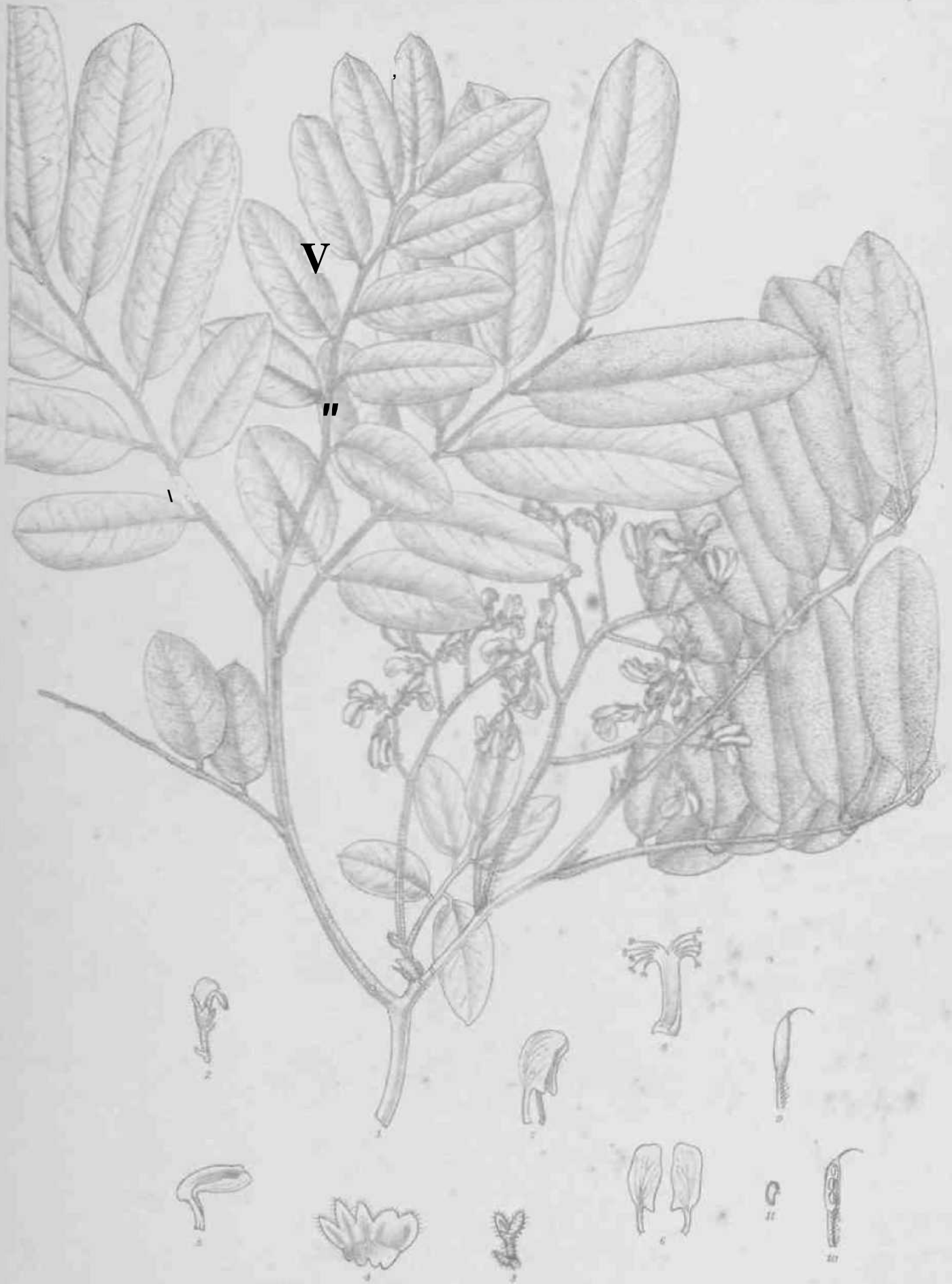
Lit: by A. K. Neeh.



Drawn by E. J. Dorr.

DALBERGIA Densa Benth. var. AUSTRALIS Prain.

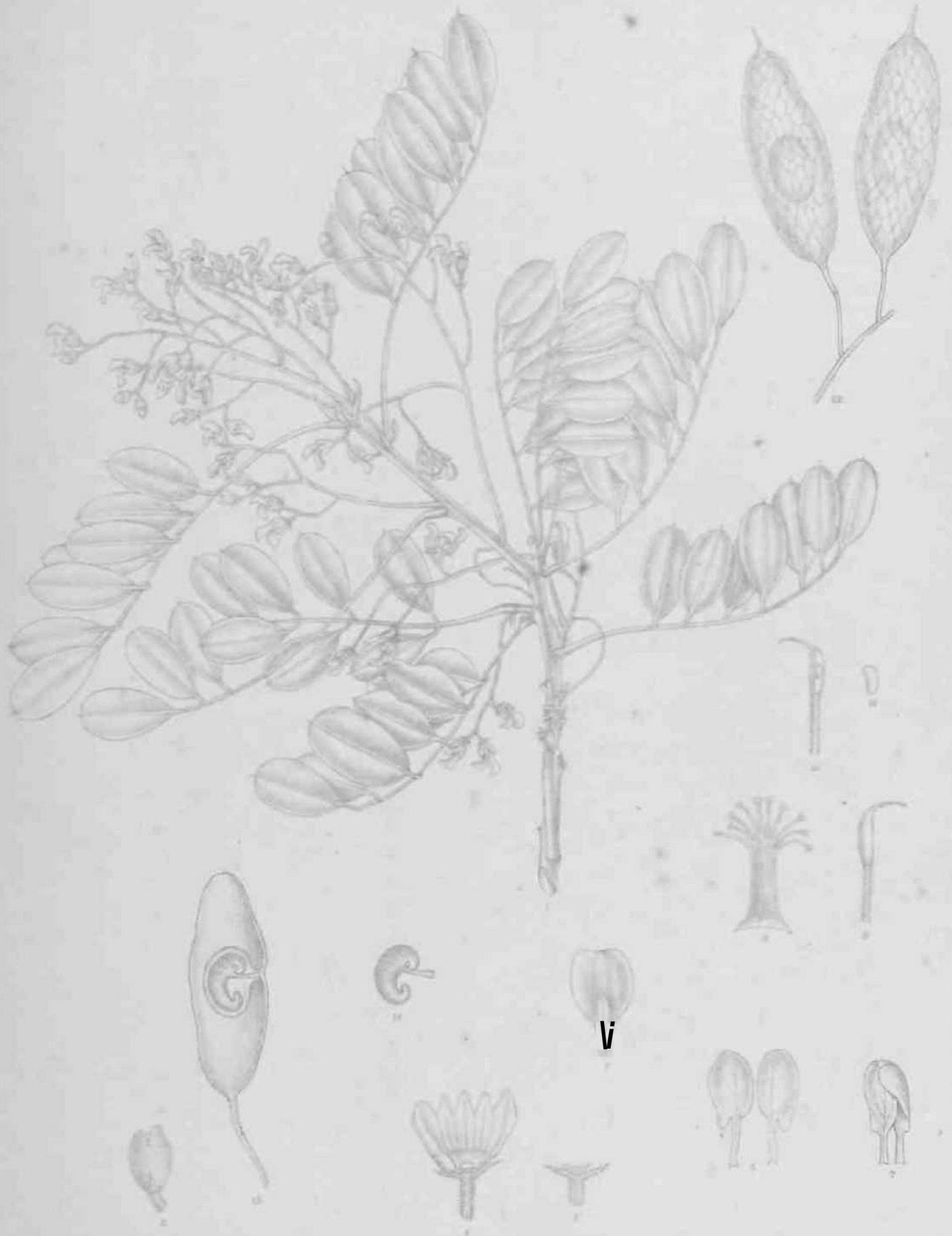
Lab. by A. C. Sengha.



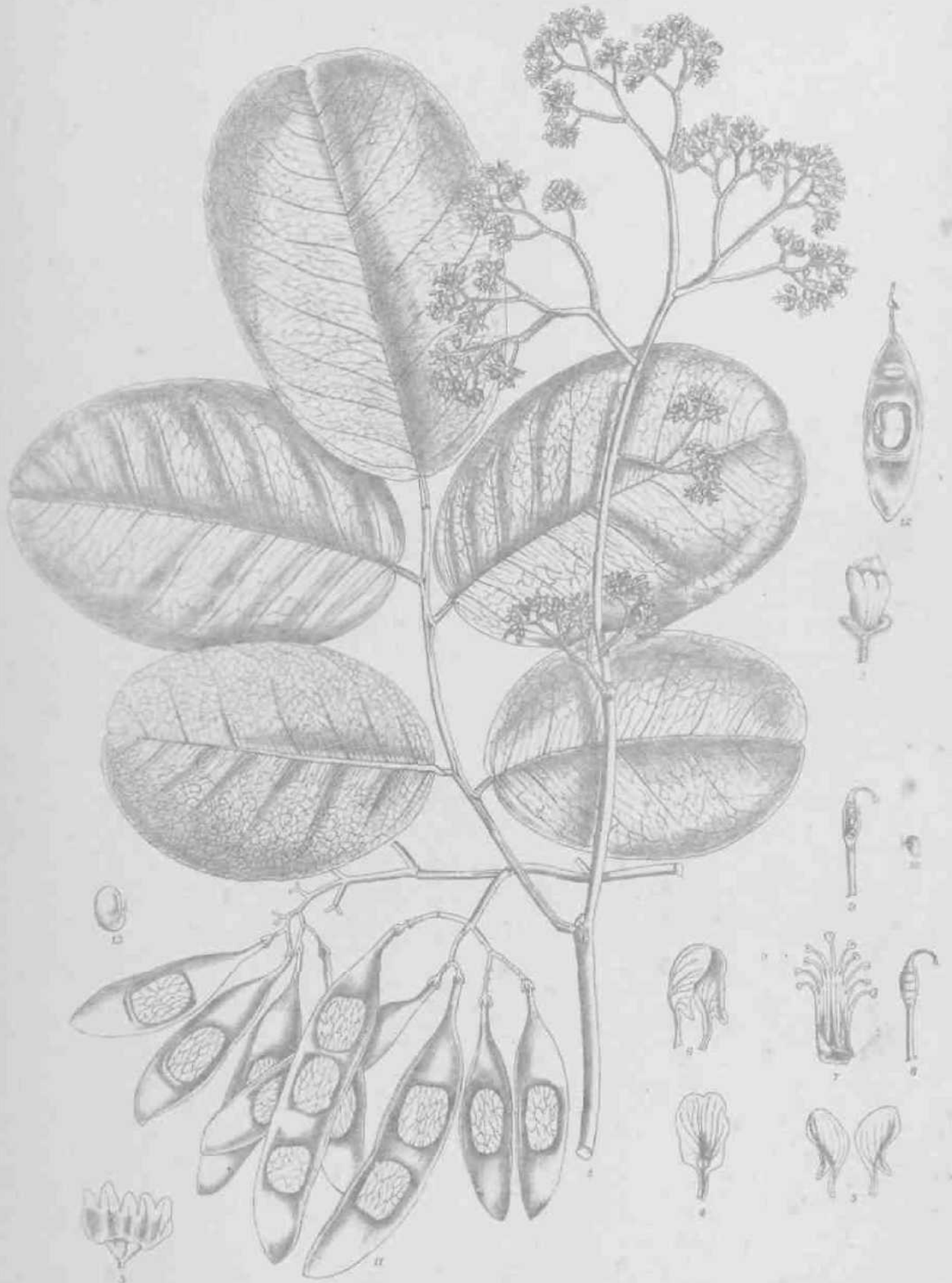
Drawn by D.N. Ghoshary.

3ALBEGIA VELUTINA Benth. var. MAINGAYI Prain.

Lith by A.N. Ruu.ru,



v





Drawn by K. P. Dass.

DALBERGIA-IA. OVATA. Grah.

Lith: by A. K. Nath.



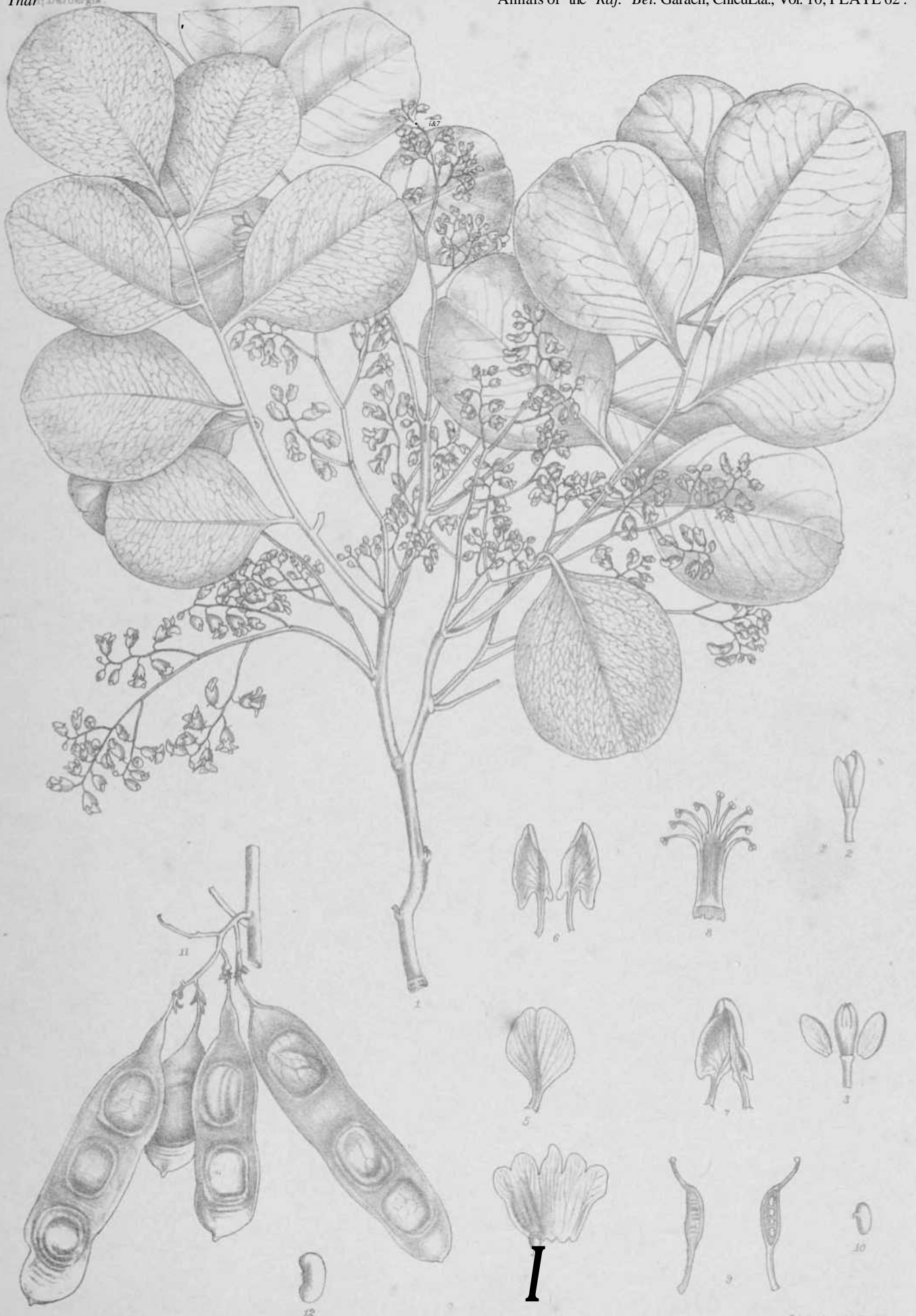


p

D. " * ^ K.P. Dorr.

DALLERGERIA TONKINENSIS Fram.

Lab. by K.P. Dorr.



Drawn by K.P.Dass.

DALBERGIA LATIFOLIA Roxb.

Lith. by K.P.Dass.



Drawn by K. Y. D. ...

DALBERGIA SISSOIDES -Grah.

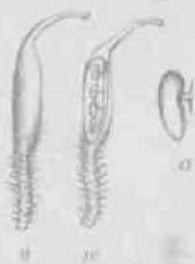
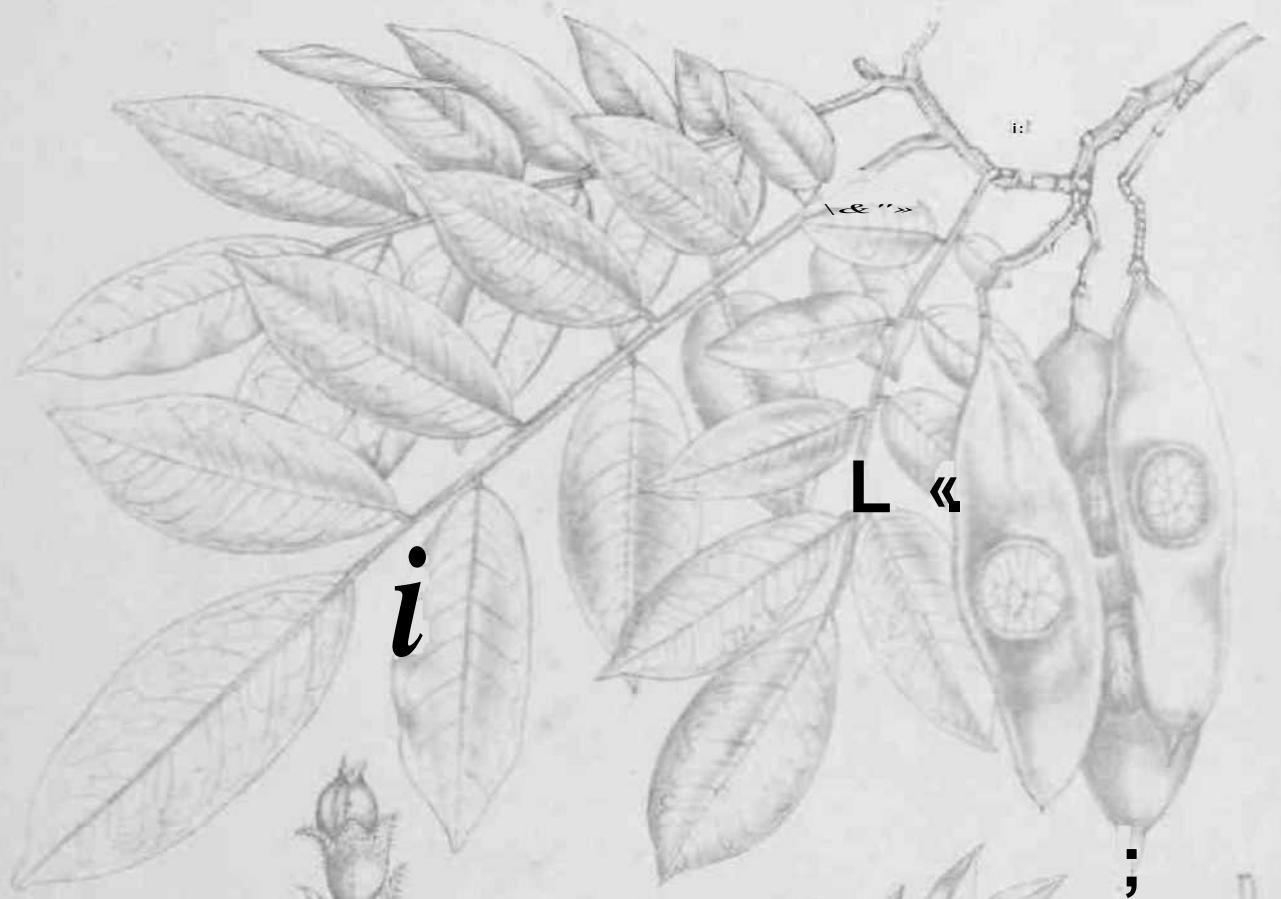
Lith. by Chitra Saha Pt



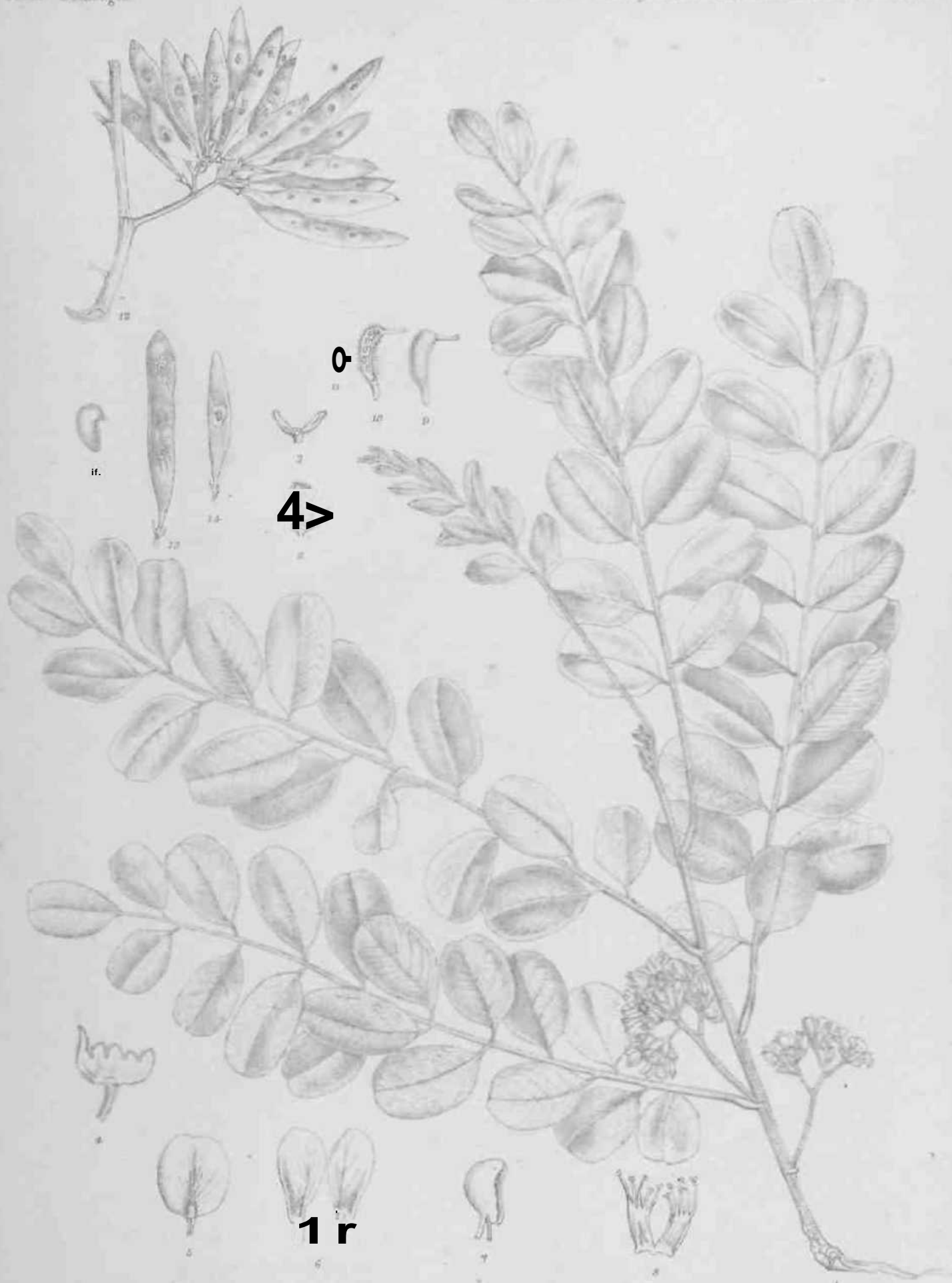
Drawn by E. F. Davis

lith. by G. S. S. Co.

DALBERGIA COCHINCHINENSIS Pierre



0



Drawn by K.P. Das

DALBERGIA SERICEA G. Don

Lith. by Charles Simey & Co.



Drawn by K. F. Dase

DALBERGIA SACERDOTUM Prain

Lith by A. E. Clowdery



Drawn by K.P. Basu.

DAIBERGIA PANICULATA Roxb.

Lith. by AC, CJwwKury.



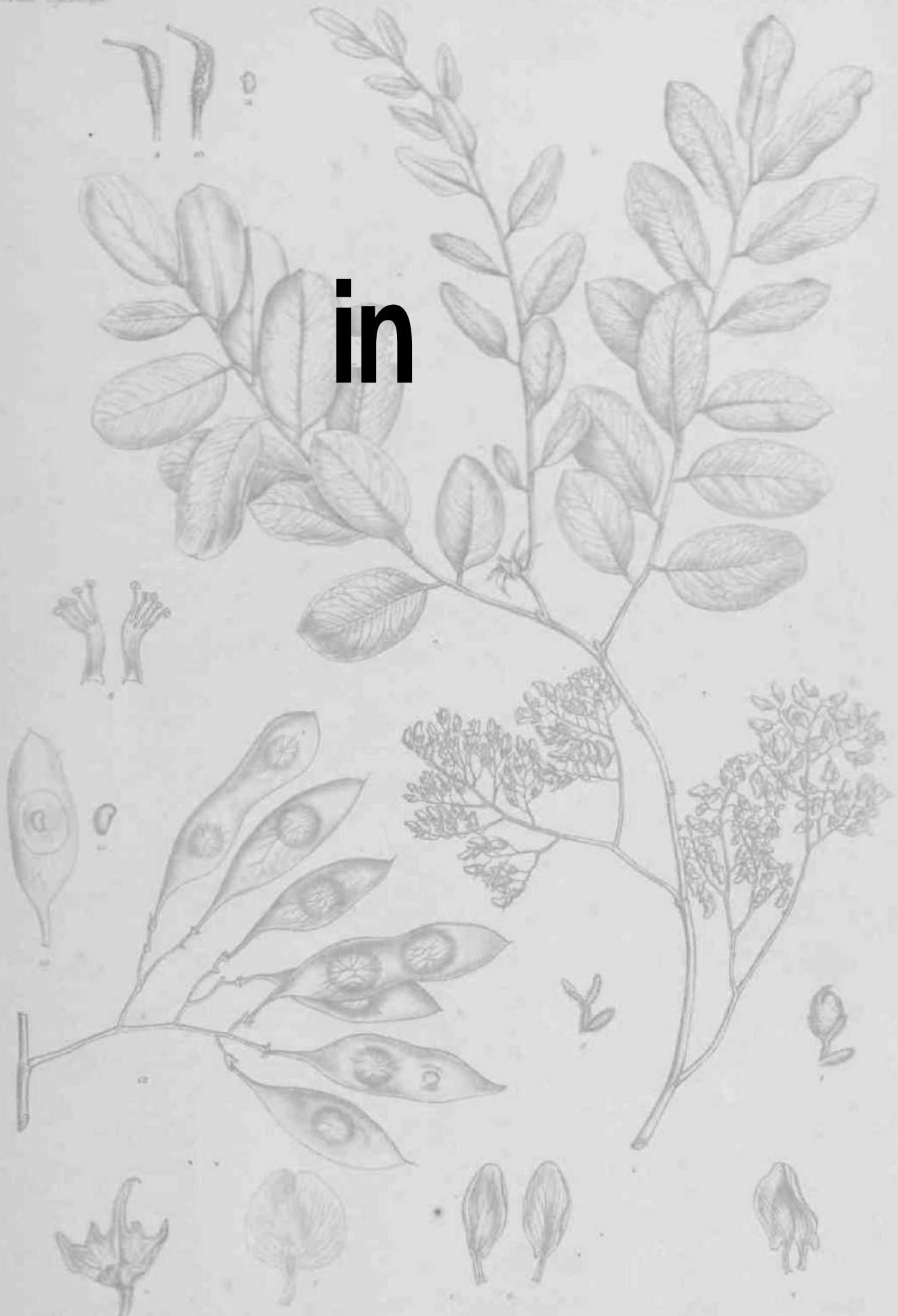


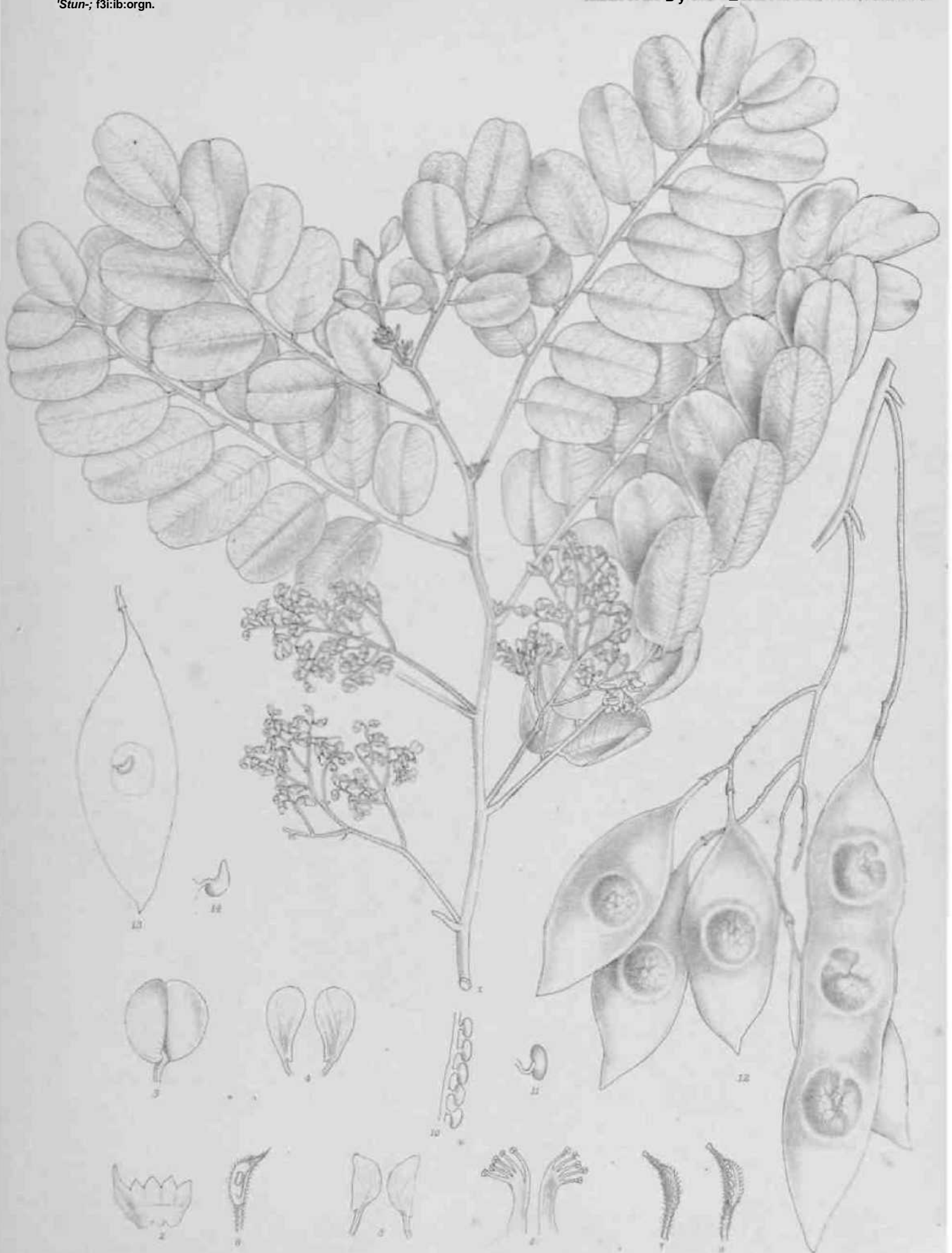
Drawn by A.D. Molla

DALBERGIA HUPEANA Haaoe,

Lith. by K.D. Chiridra*

in





Drawn by K. P. Dass.

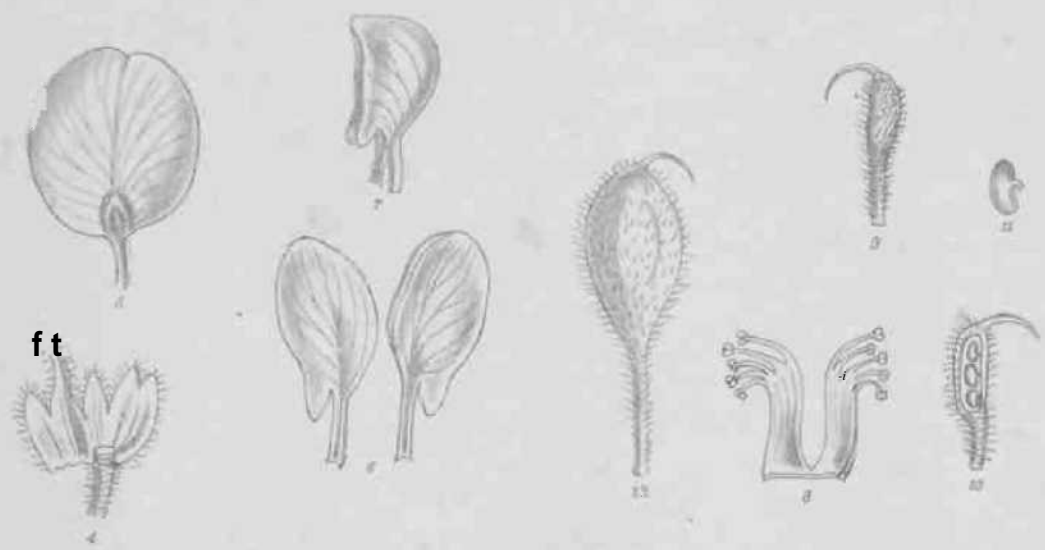
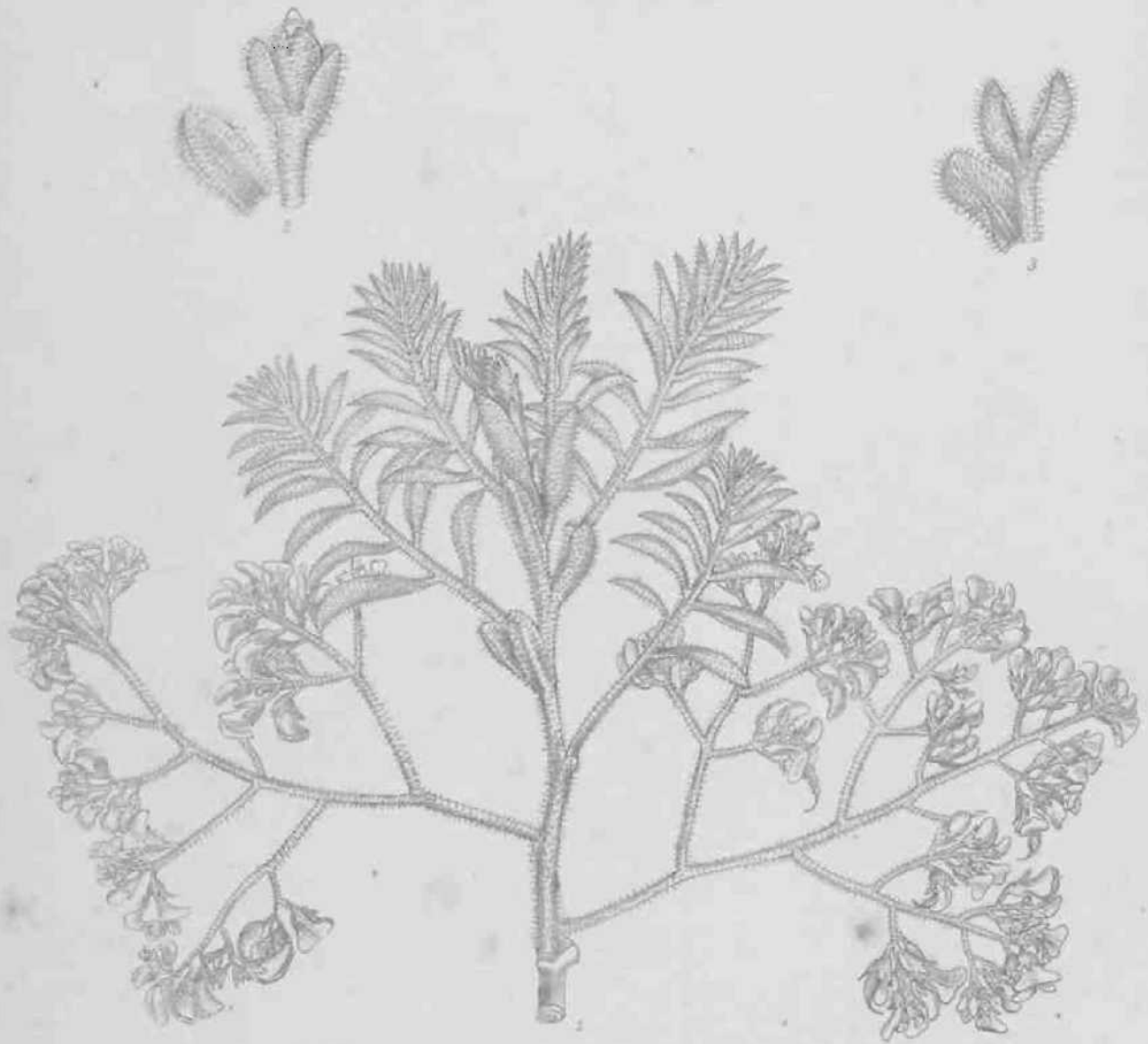
DALBERGIA BALANSAE Presl.

Lith. by K. P. Dass.



r

*

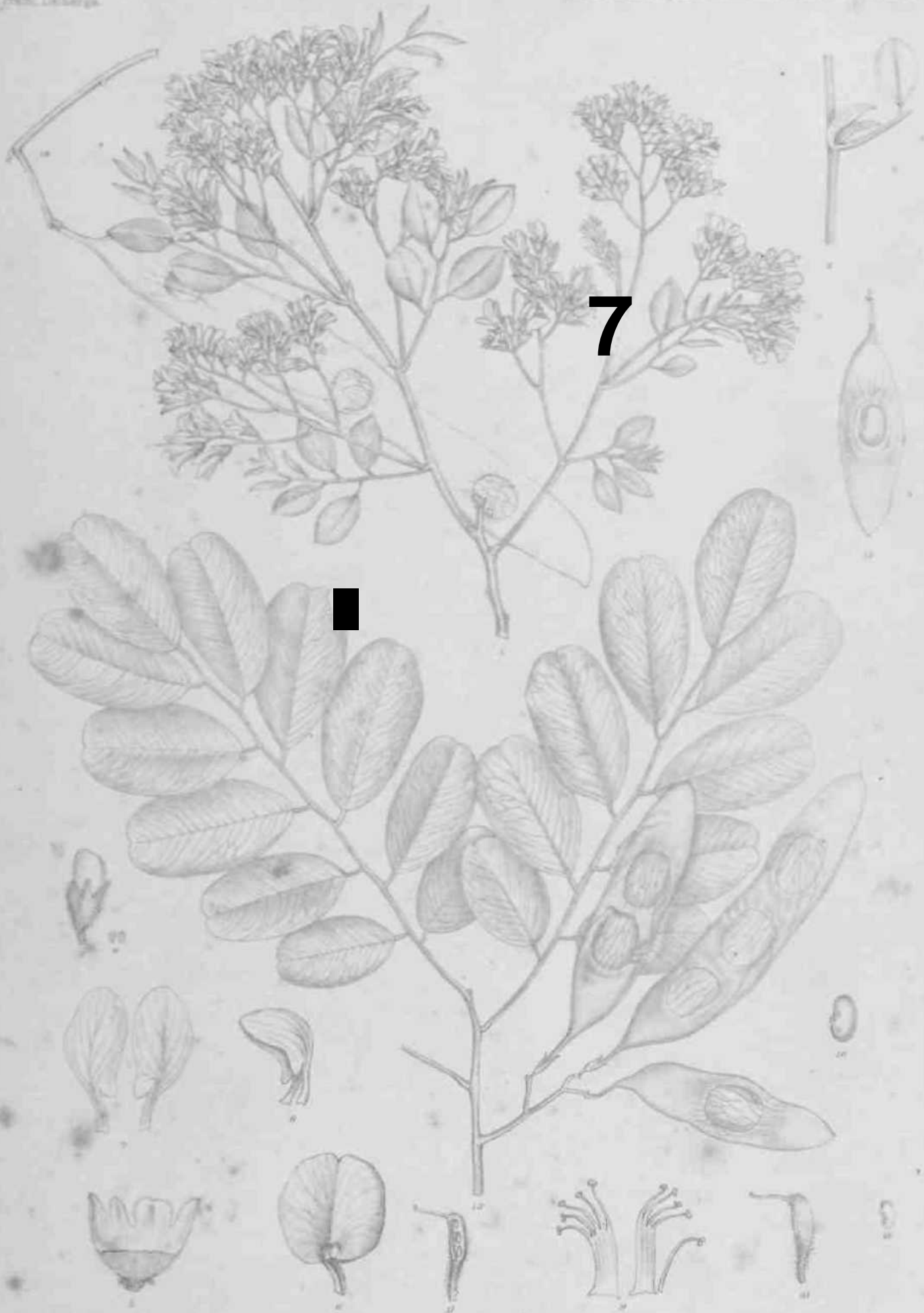




Drawn by K.P. Dass.

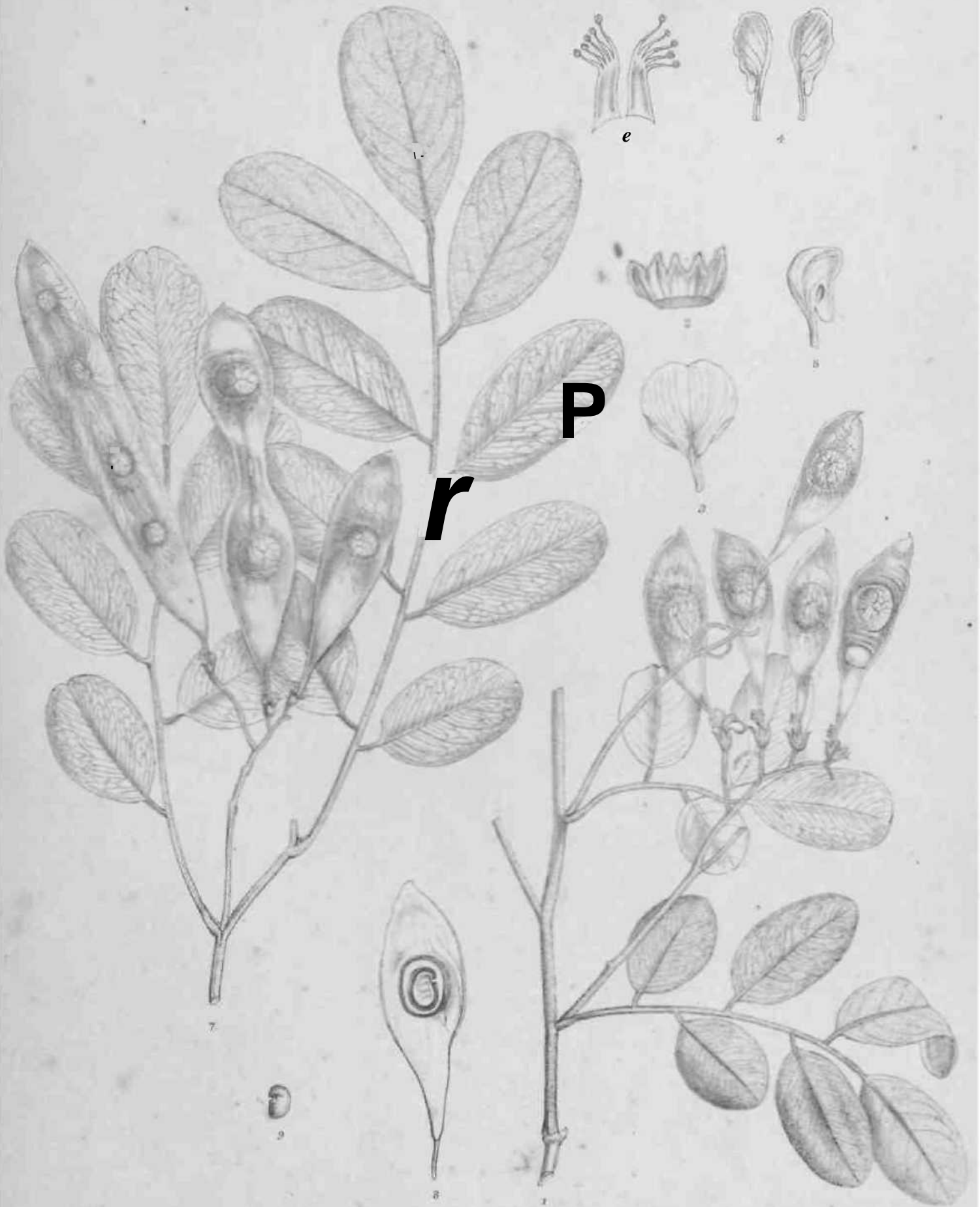
DALBERGIA. OLIVERI Gamble.

Lith: by A.N. Banerji.



7





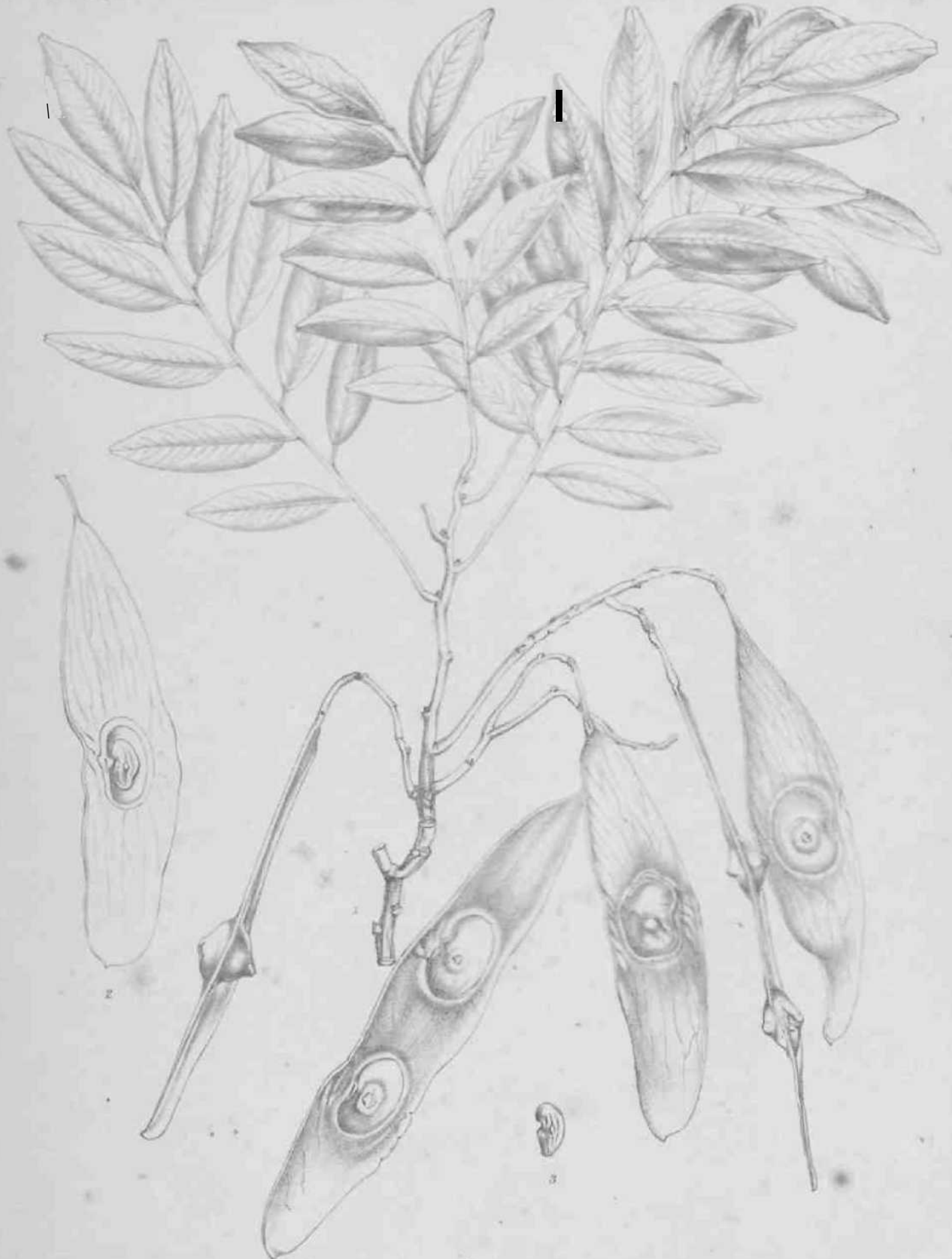
r P



Drawn by K. P.D>8S.

DAL BEKGIA TWATTII Clarke.

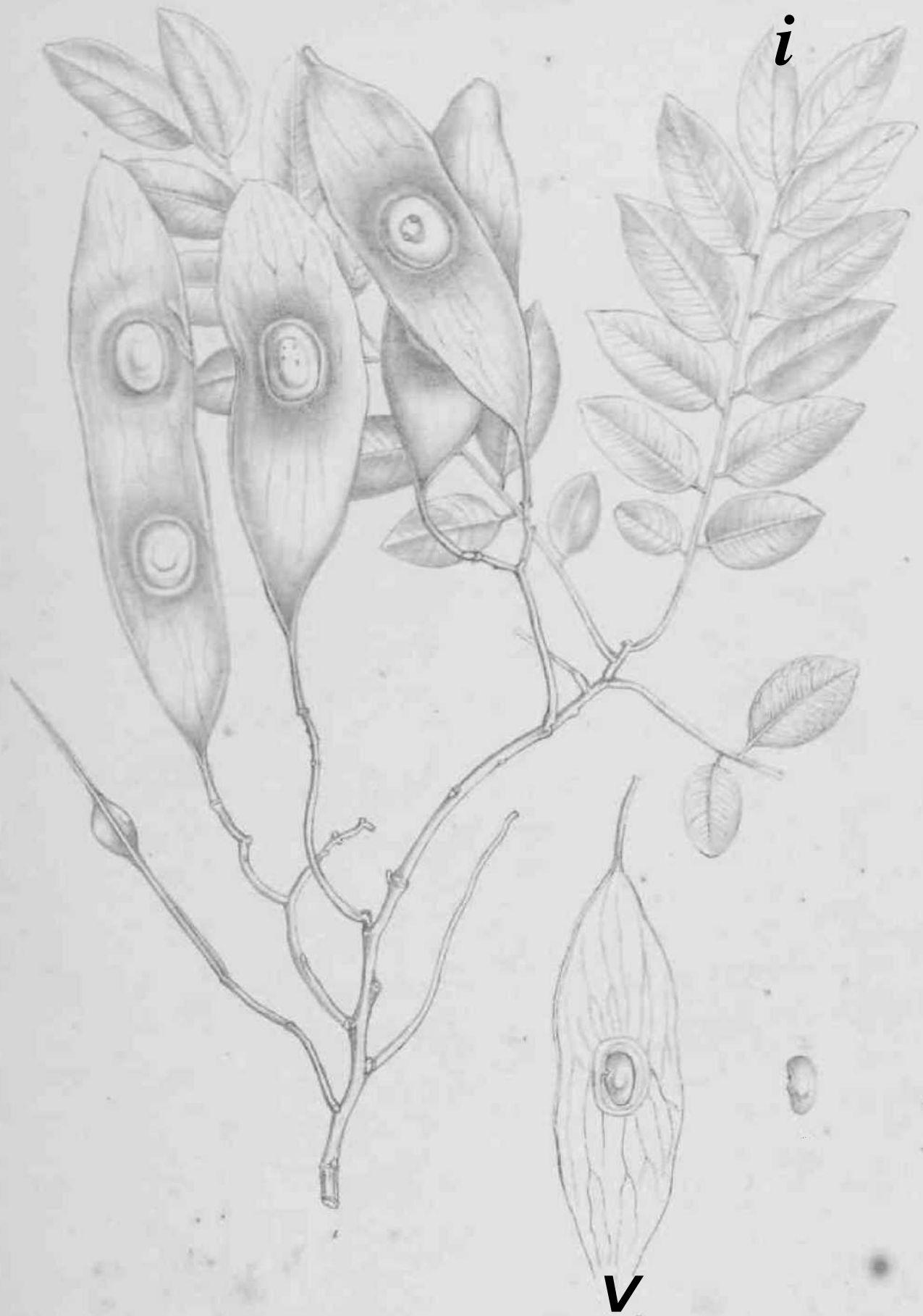
Lith. by Chitra Silpi C?



D. 1911. by K. P. Das.

DALBERGLA- MAMMOSA Pierre

Isch. j. Chitra Silpi C^o



i

v



Drawn by K.P. Dass

DALBERGIA DONGNAIENSIS Pierre.

Lith. by/ K II Ghondra.



drawn by K. P. Dasg.

DALBERGIA DUPERREANA Pierre.

Drawn by i' L. Nutt.



of?

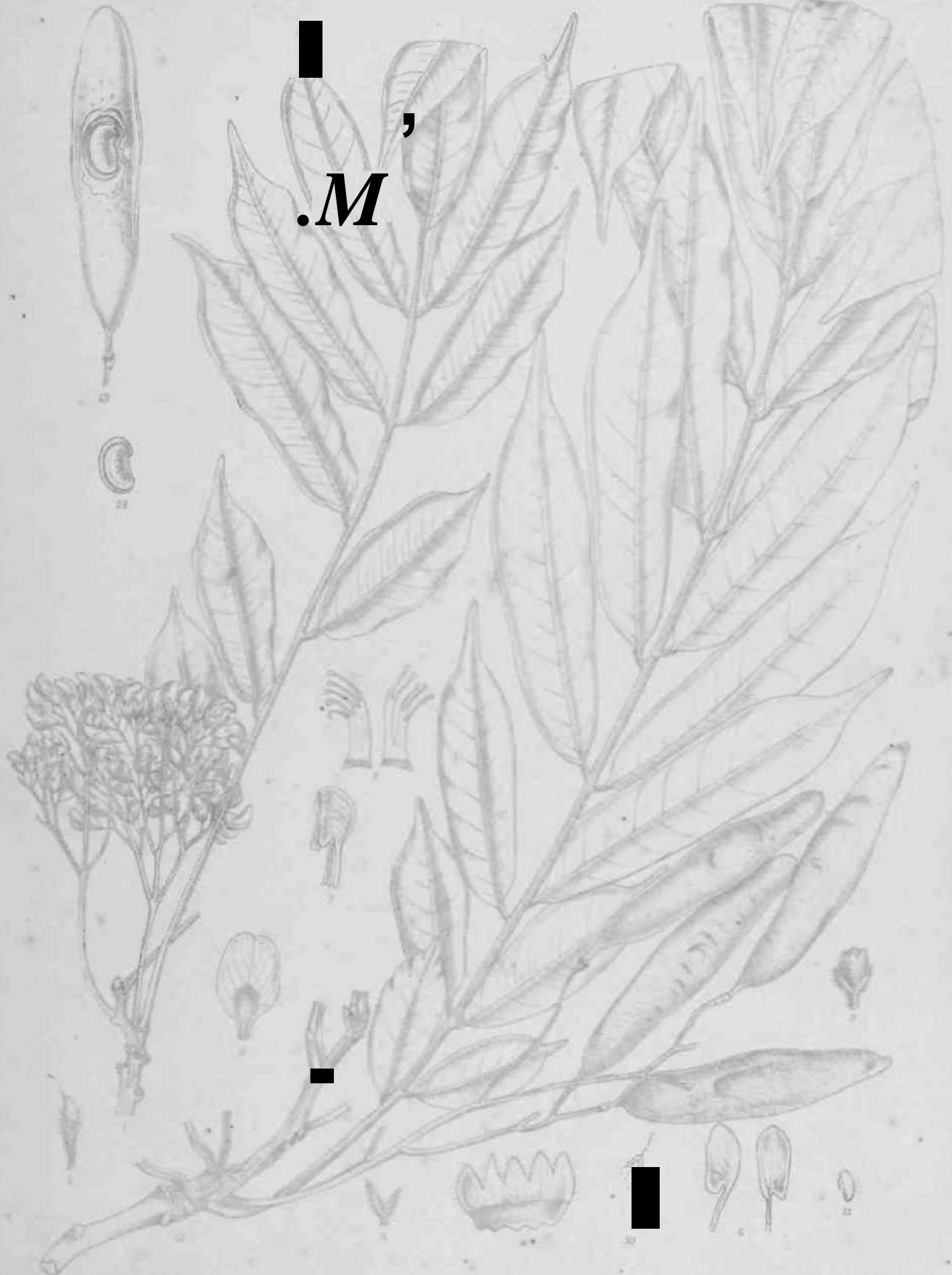
lw

Drawn by K.P. Dasg.

DALBERGIA KURZII Frain.

Litho by A.U. Chowdhury.

M



Drawn by A. H. Smith

PALPURGINA CANA Griseb.

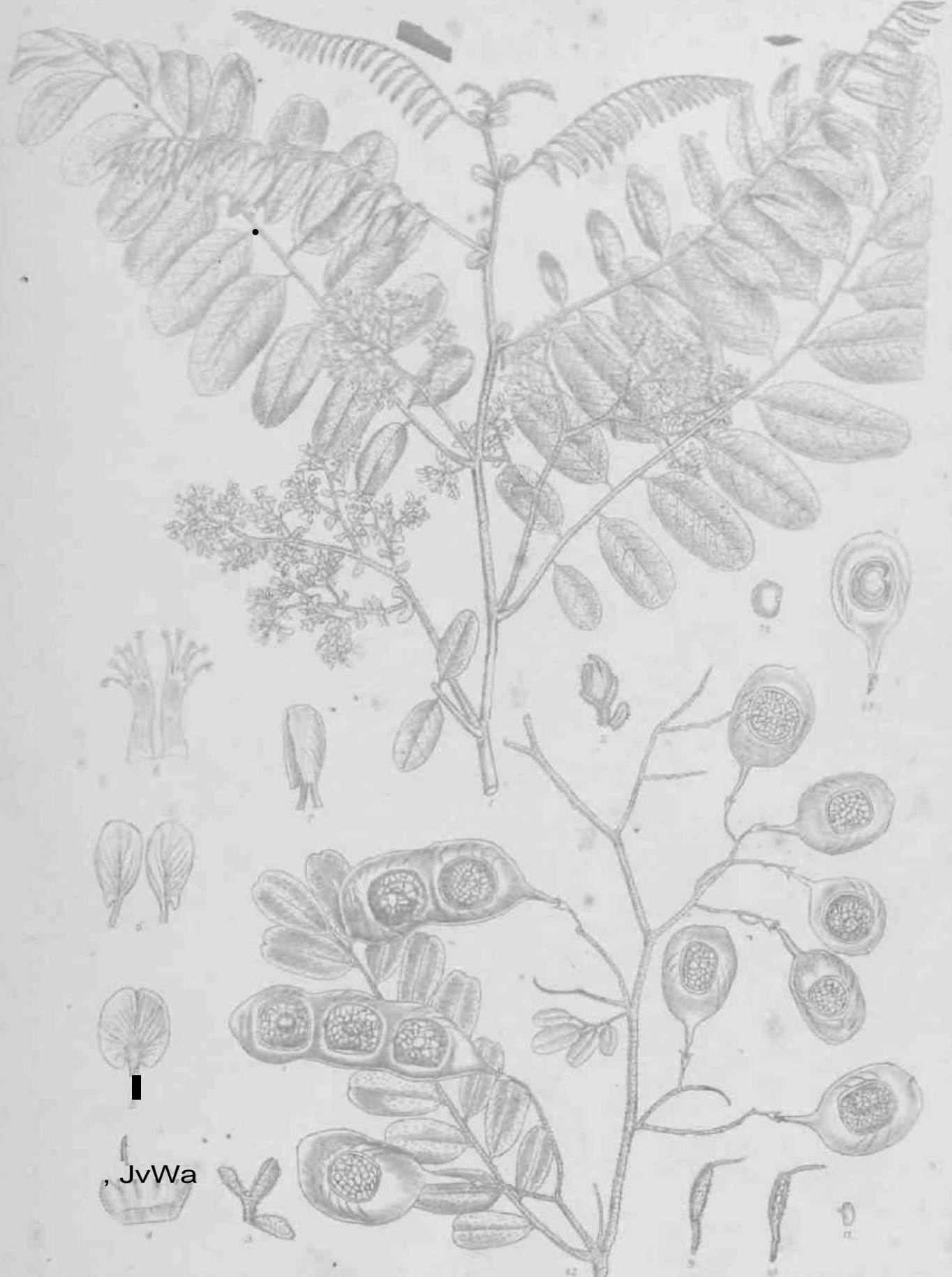
liOiv • C. Singh



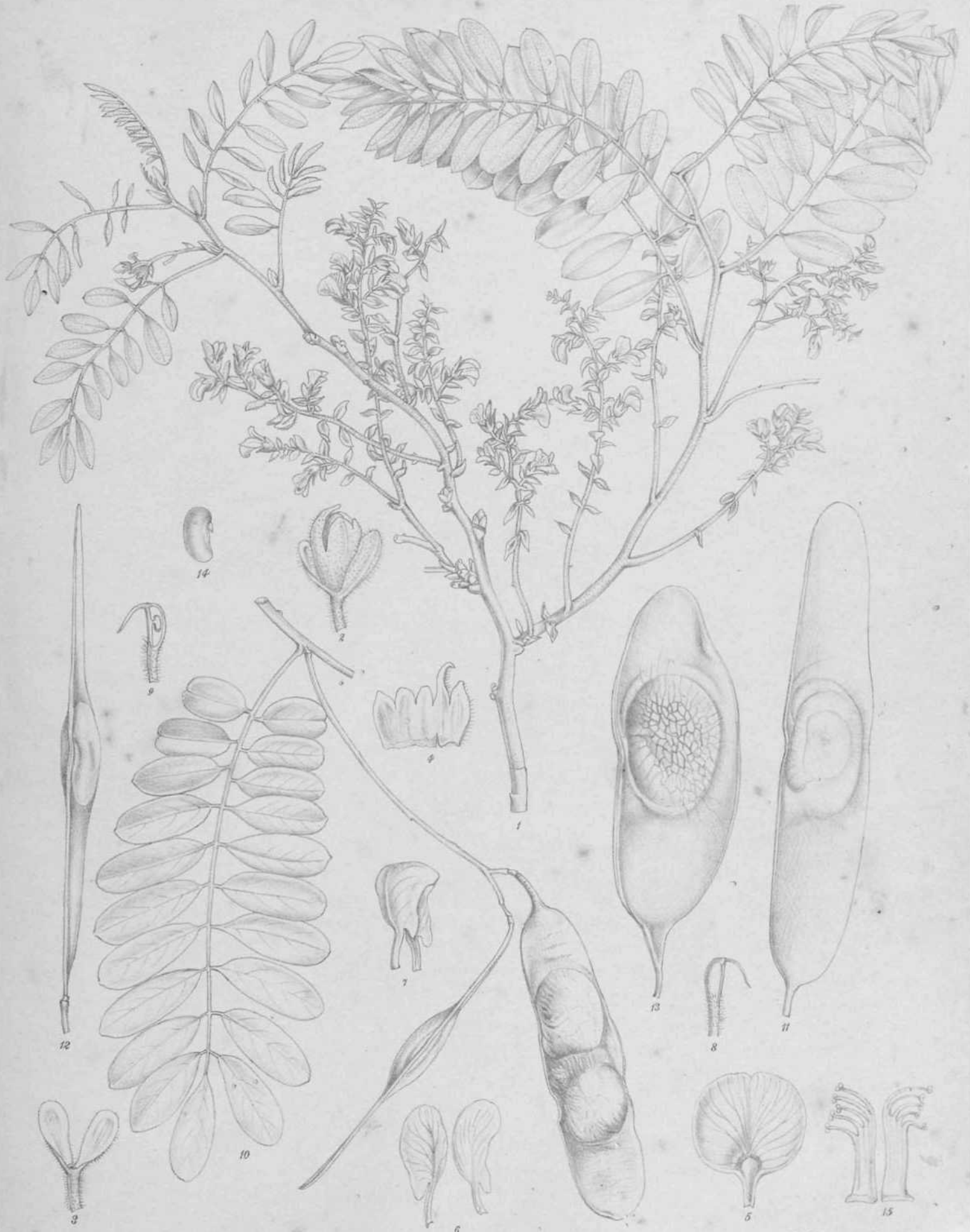
Drawn by E.P. Bass

DALBERGIA VOLUBILIS R. & S.

Lit. by t^11-05



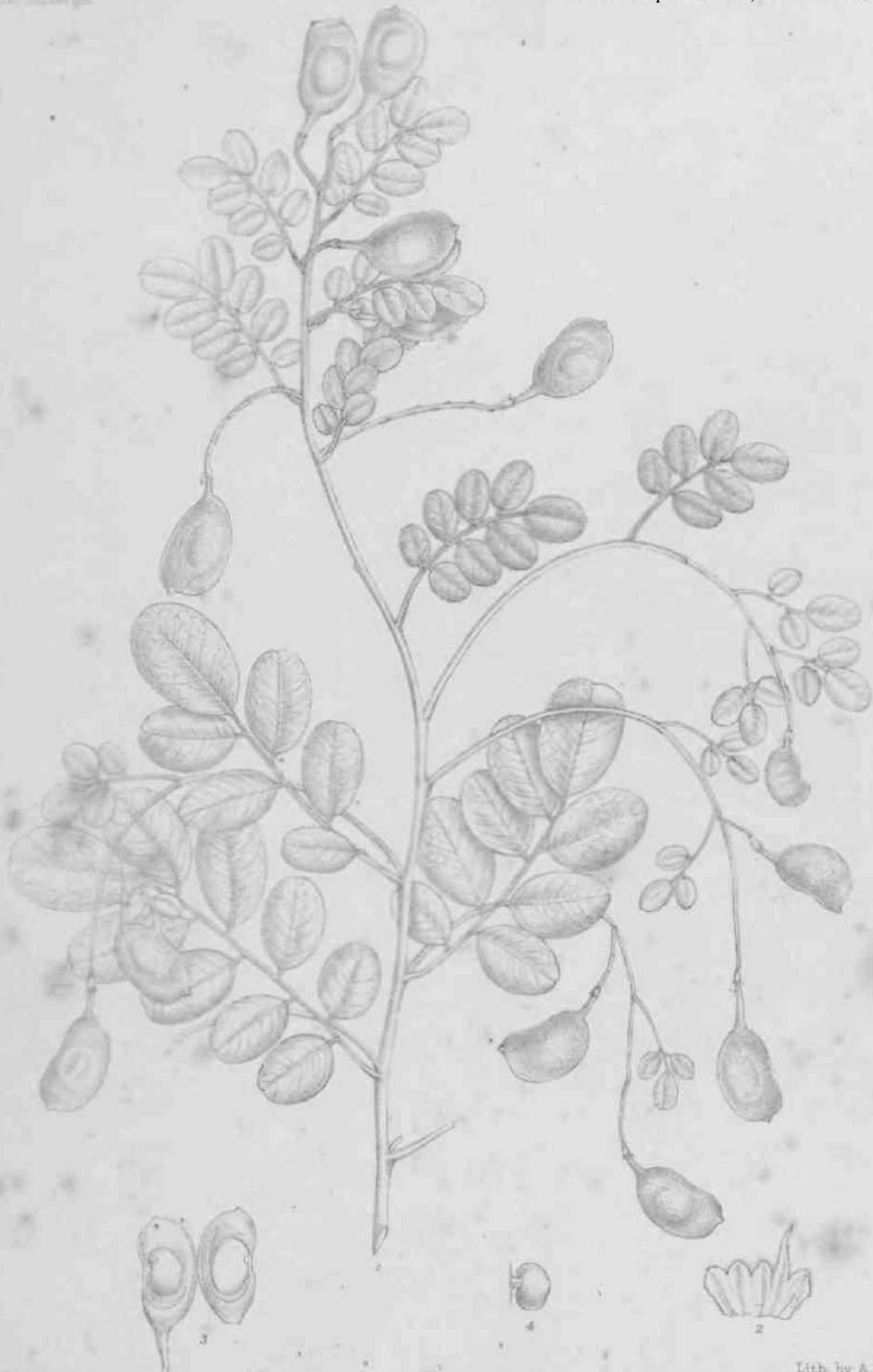
JvWa



Drawn by K.P. Dass.

DALBERGIA STIPULACEA Bwb.

Lit. by A.C. Choudhary.



Drawn by K.F. Datta

DALBERGIA GODEFROYI Prain

Lith by A.C. Sinha



Drawn by K.P. Dass.

DALBERGIA FALCATA Prain.

Litk ky ff ? Dass



Gti,

Drawn by K.P. Das.

DALBERGIA KUNTLERI Prain.

Let. by R.A. C. Singha



Drawn by K.P. Danc.

DALBERGIA RENIFORMIS Rehb.

Lith. by S.C. Mendel.

**INDIAN BOTANIC GAHDIN.
LIBRARY.**

PILOCSSEJJ

ACCESSION

CATALOGUING

CLASSIFICATION

DATE 1.8.64 DVK