AUSTRALASIAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

SYDNEY SESSION, 1898.

A Short Dichotomous Key to the hitherto known Species of Eucalyptus,

BY

J. G. LUEHMANN, F.L.S.

(Curator, National Herbarium, Melbourne).

Read before the Australasian Association for the Advancement of Science, January, 1898.

A SHORT DICHOTOMOUS KEY TO THE HITHERTO KNOWN SPECIES OF EUCALYPTUS.

By J. G. Luehmann, F.L.S. (Curator, National Herbarium, Melbourne.)

(*Read before the Australasian Association for the Advancement of Science, Tuesday, January* 11, 1898.)

The scheme herewith laid before the members of the Association, to classify the species of the genus Eucalyptus according to the fruits, is not, I may state at the outset, meant to supersede the excellent anther-system introduced by Bentham; the latter being in my opinion the most reliable which, with our present knowledge, can be devised. Frequently, however, when specimens are gathered, expanded flowers, or even well-advanced buds, are not available, while nearly every adult tree bears fruits as well as young flower-buds, and in most cases, though not in all, the species can by their aid and that of the leaves be determined with tolerable accuracy. The present arrangement should, therefore, be looked upon as devised to act as an auxiliary guide only, without any full descriptions, and is for this reason submitted in the form of a key. The primary character chosen is that of the fruit-valves, whether quite enclosed or whether the points protrude beyond the rim, or whether the top of the fruit is convex with every part raised above the rim; secondarily, the shape and size of the fruit are taken into consideration. De Candolle's classification, based on the shape of the operculum, is relied upon for further sectional divisions. While the majority of the species are without difficulty assigned to their respective divisions, there are others which form a transit and, in these cases doubts will arise, especially when we consider their remarkable variability. Even with complete material I have sometimes found it difficult to fix the limits of a species, although I devoted a great deal of time to the study to the genus while assisting the late Baron von Mueller in the elaboration of his Eucalyptographia, for which I worked up the very extensive material that had accumulated since the publication of the third volume of the Flora Australiensis. This mutability of form is well illustrated by the fact that a dozen kinds, raised from Australian seeds, have been described as new species in Europe and America by botanists of repute, although it seems improbable that they would receive seeds of a single species that had not already come under Baron von Mueller's notice. While

sometimes even a minor character appears to be constant, and affords a pretty sure clue to the identification of a species, in other cases characters that in most plants would be considered of the greatest importance will be found unreliable in Eucalypts. Thus it is also with the bark, which, though generally such a good guide, varies in some instances to a remarkable degree. This is well exemplified by Eucalyptus viminalis; this tree, which grows around the Melbourne herbarium building, shows here, in its sapling state, a smooth, whitish bark, until it attains a diameter of from 4 to 6 inches, then gradually the outer layers remain attached, at first near the base only, becoming rough and brown; as the plant gets older, these layers creep higher and higher up the stem, until, in aged trees, the whole of the trunk and also the larger branches are covered with a thick, rugged, dark brown bark. Within 10 miles inland from Melbourne, already the tree changes its character in this respect, inasmuch as only the lower part of the stem is covered with this rugged bark, while another 10 miles further towards the ranges, this species presents a smooth, white trunk, except, perhaps, just near the ground. Although the floral characters remain the same, yet, any one seeing only the two extreme forms would certainly consider them two distinct species. Euc. leucoxylon shows similar anomalies. As another instance of the difficulty of arriving at a correct limitation of the species of Eucalyptus, I may mention the fact that Bentham wrote that after he had finished his description of all the species of this genus for the Flora Australiensis, he considered it necessary to re-examine the whole of the collections, a thing which, for want of time, he did not do with any other group of plants. There is one feature which will, probably, throw more light upon the limits of species as well as their affinities, with which we are not yet sufficiently acquainted; this is the character of the seedlings. I venture to express a hope that in the near future one of our botanic gardens will undertake the investigation of this subject, which requires not only great knowledge and care, but also certain means that are only at the command of few people.

In submitting this contribution to Australian botany, I trust that with all its shortcomings it will prove of some service in identifying the species of our most important genus of timber trees.

No.		No.
Calyx four-toothed		1
Calyx truncate		2

(No. 5, *E. tetraptera* shows an approach to a four-toothed calyx.)

1. Fruit fully ½ inch long, *E. tetrodonta.*
   Fruit under ½ inch long, *E. odontocarpa.*

(Probably a variety of the above.)

No.		No
2.	Stamens united in four bundles	3
	(This character is generally also discernible in the fruit by four depressions where the stamens had been inserted.)	
	Stamens free and inserted all around the inside of the calyx	5
3.	Fruit more than 1 inch in diameter, convex above the rim of the calyx, *E. erythrocorys.*	
	Fruit less than 1 inch in diameter, the valves enclosed	4
4.	Leaves mostly opposite, ovate-lanceolate, mealy-white, *E. tetragona.*	
	Leaves scattered, lanceolate-falcate, dull green, *E. eudesmioides.*	
5.	Fruit quadrangular, about 1½ inches long, reddish, *E. tetraptera.*	
	Fruit terete or irregularly angular	6
6.	Fruit-valves quite enclosed in the capsule	7
	Fruit-valves either quite exserted or the points reaching the level of the rim	64
7.	Flowers mostly paniculated	8
	Flowers in simple umbels	35
	(Occasionally the inflorescence will appear paniculated in this section through the falling off of the leaves.)	
8.	Leaves mostly opposite...	9
	Leaves scattered	13
9.	Leaves connate	10
	Leaves not connate	11
10.	Leaves about 6 inches long, 3 inches broad, *E. perfoliata* (allied to No. 31, *E. corymbosa*).	
	Leaves not exceeding 2 inches in length, *E gamophylla.*	
11	Leaves mostly ovate, not exceeding 2 inches in length	12
	Leaves lanceolate, at least 3 inches long	13
12.	Calyx bristly, *E. setosa.*	
	Calyx glabrous, *E. aspera.*	
13.	Fruit ½ to ¾ inch in diameter, *E. ferruginea.*	
	Fruit not exceeding ⅓ inch in diameter, *E. clavigera.*	
	(*E. grandifolia* and *E. Papuana* are varieties of this.)	
14.	Leaves mostly peltate, *E. peltata.*	
	Leaves attached to the stalks at the base	15
15.	Leaves of equal colour on both sides	16
	(See also Nos. 31 and 34.)	
	Leaves paler beneath than above	24
16.	Fruit at least ⅓ inch in diameter, more or less urceolate	17
	Fruit rarely exceeding ¼ inch	19

No. No,

17. Flowers and fruits sessile, *E. eximia.*
Flowers and fruits pedicellate 18
18. Leaves lanceolate, operculum double, *E. maculata* (this includes as varieties *E. citriodora* and *E. melissiodora*).
Leaves ovate, operculum single, *E. latifolia.*
19. Leaves from orbicular to ovate, *E. polyanthema.*
(*E. populifolia*, which sometimes has the valves barely exserted, is readily distinguished by the dark, shining leaves, those of *E. polyanthema* being quite dull and greyish-green.)
Leaves from lanceolate-falcate to ovate-lanceolate ... 20
20. Operculum conical, *E. hemiphloia.*
(This includes *E. albens* as a mealy-white variety, and probably, also, *E. Bowmani*, described from insufficient material.)
Operculum hemispherical, rarely shortly conical ... 21
21. Leaves ovate-lanceolate... 22
Leaves lanceolate 23
22. Fruit truncate-ovate, about 2 lines long, *E. Behriana.*
Fruit urceolate, 1 line long, *E. brachyandra.*
23. Leaf-veins very oblique, not numerous, anastomosing, *E. largiflorens* (= *E. bicolor*, Cunn.).
Leaf-veins very diverging, numerous, hardly anastomosing, *E. tesselaris.*
24. Fruit with eight prominent longitudinal ridges, over 1 inch long, *E. ptychocarpa.*
Fruit without prominent ridges 25
25. Branchlets with ferrugineous hairs, *E. Torelliana.*
Branchlets glabrous 26
26. Fruit urceolate 27
Fruit ovate or globose-truncate 33
27. Fruit not exceeding 4 lines in length, *E. trachyphloia.*
Fruit over $\frac{1}{2}$ inch long 28
28. Operculum broader than the calyx, *E. Watsoniana.*
Operculum not broader than the calyx 29
29. Fruit under 1 inch in diameter 30
Fruit exceeding 1 inch in diameter 32
30. Peduncles stout, pedicels none, *E. Abergiana.*
Peduncles slender, flowers pedicellate... 31
31. Leaves lanceolate, *E. corymbosa.*
(Including as varieties E. terminalis, E. dichromophloia, and E. pyrophora, as I find it impossible to draw a clear line of demarcation; the specimens from the dry interior and from the north-west have the leaves frequently of equal colour on both sides, and the fruits are occasionally rather ovate-truncate than urceolate.)
Leaves very large, ovate, *E. Foelscheana.*

No. No.

32. Flowers white, rarely pink; seeds very large, black, not winged, *E. calophylla.*
Flowers red; seeds brown, winged, *E. ficifolia.*

33. Fruit truncate-globular, sessile, *E. Howittiana.*
Fruit truncate-ovate, pedicellate 34

34. Operculum depressed-hemispherical, *E. Cloeziana.*
Operculum more or less conical, *E. paniculata.*

(The variety fasciculosa from the dry north-west of Victoria differs in having the leaves of equal colour on both sides and the bark of the trunk smooth.)

35. Fruit two-celled, *E. phoenicea.*
Fruit with three or more cells... 36

36. Fruit nearly 2 inches long, *E. miniata.*
Fruit not exceeding 1 inch 37

37. Operculum projecting beyond the rim of the calyx ... 38
Operculum not broader than the calyx 39

38. Leaves somewhat paler beneath, *E. corynocalyx.*
Leaves of equal colour on both sides, *E. urnigera.*

39. Leaves opposite... 40
Leaves scattered 41

40. Leaves orbicular, *E. Kruseana.*
Leaves lanceolate, *E. doratoxylon.*

41. Leaves with several longitudinal veins almost parallel with the midrib 42
Leaves with the veins all more or less diverging from the midrib 43

42. Operculum conical, leaves rather small, *E. stellulata.*
Operculum hemispherical, leaves large, *E. coriacea* (= E. pauciflora).

43. Leaves much paler beneath, *E. diversicolor.*

(Occasionally cultivated under the name of E. colossea. E. marginata has the valves sometimes enclosed, and is then distinguished from E. diversicolor by the conical operculum.)

Leaves of equal colour on both sides or nearly so ... 44

44. Pedicels elongated 45
Pedicels short or none 47

45. Operculum hemispherical, *E. sepulcralis.*
Operculum conical 46

46. Leaf-veins very spreading, *E. longifolia.*
Leaf-veins very oblique *E. leucoxylon*

47. Fertile seeds membranously winged, *E. Todtiana.*
Fertile seeds not winged 48

No. No.

48. Fruit much contracted at the orifice, nearly globular 49
Fruits but slightly or not at all contracted 50

49. Fruits nearly 1 inch in diameter, *E. buprestium.*
Fruits about $\frac{1}{4}$ inch in diameter, *E. piperita.*

(Some specimens from near Port Jackson have almost urceolate fruits, but seem gradually to pass into the other form.)

50. Fruits nearly 1 inch in diameter, *E. Planchoniana.*
Fruits rarely exceeding $\frac{1}{2}$ inch... 51

51. Peduncles mostly recurved 52
Peduncles erect... 53

52. Operculum conical, *E. decurva.*
Operculum hemispherical, *E. Cooperiana.*

53. Base of the calyx as well as of the operculum abruptly dilated into a furrowed ring, *E. torquata.*
Base of calyx and operculum without these dilatations 54

54. Peduncles short and thick, usually much flattened, *E. incrassata.*

(An extremely variable species; E. dumosa seems to pass into it by almost imperceptible degrees, although it can generally be distinguished by smaller flowers and fruits and less flattened peduncles. E. grossa, which is the same as E. pachypoda, appears to be also a variety with blunt, but rather long, operculum. See also No. 108, E. goniantha.)

Peduncles nearly terete, mostly slender 55

55. Calyx angular 56
Calyx terete 57

56. Fruit about $\frac{1}{4}$ inch long, *E. gracilis.*
Fruit about $\frac{1}{2}$ inch long, *E. ochrophloia.*
(Perhaps a variety of the above).

57. Calyx and operculum granular—rough 58
Calyx and operculum smooth 60

58. Large tree, with fibrous bark; leaves mostly very inequilateral, *E. obliqua.*

(Sometimes cultivated under the name of E. fissilis.)

Shrubs or small trees with smooth bark 59

59. Leaves rather small, nearly straight, *E. stricta.*

(This is the typical E. stricta of Sieber, well described in Mueller's Eucalyptographia, with reniform anthers. Bentham, in Flora Austr. III, 217, apparently had a mixture of two species before him, describing the fruit of E. stricta, but the anthers of another species.

No. No.

Leaves large, falcate; umbels generally enclosed in large bracts while in bud, *E. virgata.*

(Although I believe that Baron von Mueller was correct in including this also as a variety in E. stricta, yet I have kept it distinct as the appearance of the extreme forms is so very different. Both seem confined to the south-eastern parts of New South Wales. Bentham had also in this case a mixture before him, viz., a few specimens of the genuine E. virgata, but mostly those of a large tree allied to E. haemastoma, afterwards described by F. v. Mueller as E. Sieberiana. E. obtusiflora seems to have been described by De Candolle from imperfect material; an original leaf and a sketch of the specimen point, perhaps, to E. haemastoma, but a second leaf is quite different. The name had better be discarded.)

60. Leaves nearly straight, very shining, *E. fœcunda.*

(Includes E. loxophleba as a variety.)

Leaves falcate, inequilateral, dull green or hardly shining 61

61. Fruits about ½ inch in diameter, *E. patens.*
Fruits not exceeding ⅓ inch 62

62. Fruit generally 5 or 6 celled, *E. Bosistoana.*
Fruit mostly 4-celled 63

63. Fruit truncate-ovate, *E. odorata.*
Fruit truncate-globular, *E. melliodora.*

(When in flower E. melliodora is readily distinguished by the outer stamens being sterile. In Mueller's Eucalyptographia the anthers are not correctly drawn; they open by terminal pores.)

64. Flowers generally paniculated... 65
Flowers mostly in simple umbels 74

65. Leaves distinctly paler beneath, *E. Raveretiana.*
Leaves of equal colour on both sides 66

66. Leaves opposite... 67
Leaves scattered 68

67. Fruit truncate-ovate, about 4 lines long (a box-tree) *E. pruinosa.*
Fruit truncate-globular, 2 or 3 lines long (an ironbark tree), *E. melanophloia.*

68. Leaves ovate, or orbicular 69
Leaves lanceolate 70

69. Calyx about 3 lines in diameter, *E. oligantha.*
Calyx under 2 lines in diameter, *E. populifolia.*

70. Operculum about 3 lines long, *E. siderophloia.*
Operculum not exceeding 2 lines 71

No. No

71. Fruit-valves much exserted, *E. microtheca.*

(As pointed out already by Baron von Mueller, in his Eucalyptographia, Turczaninow's *E. brachypoda*, to which Mr. Bentham referred this, must be some other species, probably an aberrant form of a known plant.)

Fruit-valves level with, or hardly projecting beyond the rim 72

72. Fruit 3 to 4 lines in diameter, *E. drepanophylla.*

(Includes as a variety *E. leptophleba.*)

Fruit not exceeding 2 lines 73

73. Leaves linear-lanceolate, *E. crebra.*
Leaves ovate-lanceolate, lemon-scented, *E. Staigeriana*

74. Fruits 2 inches in diameter 75
Fruits not exceeding 1 inch 76

75. Leaves opposite, *E. macrocarpa.*
Leaves scattered, *E. pyriformis.*

76. Leaves paler beneath 77
Leaves of equal colour on both sides 86

77. Operculum broader than the calyx, *E. robusta.*
Operculum not exceeding the calyx 78

78. Calyx angular, *E. botryoides.*
Calyx terete 79

79. Fruit ½ inch or more in diameter 80
Fruit under ½ inch in diameter 81

80. Fruit-valves very short, hardly exserted, *E. marginata.*
Fruit-valves long, much exserted, *E. pellita.*

(Perhaps a variety of *E. resinifera.*)

81. Operculum longer than the calyx tube, *E. resinifera*
Operculum shorter than the calyx tube 82

82. Leaves much paler beneath, the lateral veins numerous and very spreading 83
Leaves slightly paler beneath, the lateral veins not very close and moderately spreading 84

83. Pedicels very short, or none, *E. saligna.*
Pedicels elongated, *E. microcorys.*

84. Fruit broadest at the orifice; fertile seeds much larger than the sterile ones 84A
Fruit contracted at the orifice; fertile seeds not much larger than the sterile ones... 85

84A. Operculum hemispherical; fruits small, *E. propinqua.*
Operculum bluntly conical, *E. punctata.*

No.		No.
85.	Fruit about four lines in diameter, rim thick, *E. pilularis.*	
	Fruit not exceeding three lines, rim thin, *E. acmenoides* (= *E. triantha* in Mueller's Census).	
86.	Leaves mostly opposite. (See also No. 138, *E. dealbata.*)	87
	Leaves scattered	91
87.	Fruit about 1 inch in diameter, top-shaped, *E. Preissiana.*	
	Fruit rarely exceeding ½ inch, truncate-ovate ...	88
88.	Leaves connate, *E. Perriniana.*	
	Leaves not connate (except sometimes in *E. Risdoni*)	89
89.	Leaves with crenulated margin, *E. cordata.*	
	Leaves with entire margin	90
90.	Leaves obtuse, ovate or almost orbicular, *E. pulverulenta.* (This includes *E. cinerea* as a variety.)	
	Leaves acute, ovate, *E. Risdoni.* (Sometimes the leaves are connate, while in age they occasionally become alternate, and assume a lanceolate form, verging towards *E. amygdalina*, with which the plant was combined by F. v. Mueller as a variety.)	
91.	Flowers and fruits on long, slender pedicels, fruits rather large	92
	Flowers and fruits on short pedicels or sessile (except sometimes *E. Maideni*)	93
92.	Fruit top-shaped, filaments red, *E. erythronema* (= *E. conoidea*).	
	Fruit truncate-ovate, filaments whitish, *E. caesia.*	
93.	Operculum much broader than the calyx, *E. gomphocephala.*	
	Operculum not or slightly broader than the calyx ...	94
94.	Calyx and operculum warty	95
	Calyx and operculum smooth or rough, but not warty	96
95.	Leaves lanceolate, *E. globulus.*	
	Leaves ovate, *E. alpina.*	
96.	Leaves not over 1 inch long, *E. vernicosa.*	
	Leaves much exceeding 1 inch	97
97.	Stamens straight in the bud. (See also No. 140, *E. tereticornis*)	98
	Stamens bent inward in the bud	101
98.	Fruits of the umbel connate into one mass, *E. Lehmanni* (included in *E. cornuta* by F. v. Mueller).	
	Fruits free	99
99.	Fruit-valves ending in long, fine points, *E. cornuta.* (including as a variety *E. annulata.*)	
	Fruit-valves short	100

No.		No.
100.	Leaves lanceolate, *E. occidentalis.* (including *E. macrandra* and *E. spathulata* as varieties.)	
	Leaves ovate, *E. platypus.* (Baron von Mueller adopted in his Eucalyptographia Turczaninow's name of *E. obcordata*, which appellation seems to me quite misleading and has no claim to priority.)	
101.	Fruit from ½ to 1 inch in diameter	102
	Fruit mostly under ½ inch	105
102.	Top of fruit nearly flat	103
	Top of fruit convex	104
103.	Leaves shining, *E. megacarpa.*	
	Leaves dull, very coriaceous, *E. cosmophylla.*	
104.	Calyx terete, *E. Oldfieldi.* (*E. Drummondi* seems a variety of this, being smaller in all its parts.)	
	Calyx angular, *E. pachyphylla.*	
105.	Leaves ovate, but acute, rarely ovate-lanceolate, *E. alba.* (*E. platyphylla* I cannot distinguish from this, even as a variety.)	
	Leaves lanceolate, rarely linear	106
106.	Calyx and operculum strongly ribbed	107
	Calyx and operculum not ribbed	109
107.	Operculum quite hemispherical, *E. corrugata.*	
	Operculum elongated	108
108.	Operculum obtuse, *E. goniantha.*	
	Operculum pointed, *E. falcata.*	
109.	Calyx angular, pedicels flattened, *E. goniocalyx.*	
	Calyx and pedicels terete	110
110.	Fruit-valves ending in fine points	111
	Fruit-valves short, often deltoid	114
111.	Capsule raised above the rim...	112
	Capsule inserted below the rim	113
112.	Operculum conical, flowers closely sessile *E. decipiens*	
	Operculum hemispherical, *E. pallidifolia.*	
113.	Leaves generally dull greyish-green, *E. oleosa.*	
	Leaves shining on both sides, *E. salmonophloia.*	
114.	Capsule inserted below the rim of the calyx or on a level with it	115
	Capsule raised above the rim...	131
115.	Leaves linear, *E. angustissima.* (See also No. 130 E. amygdalina.)	
	Leaves lanceolate.	116
116.	Fruit urceolate, *E. Baileyana.*	
	Fruit mostly ovate truncate, never urceolate ...	117

No.		No.
117.	Pedicels very slender, at least three times as long as the calyx, *E. leptopoda.*	
	Pedicels short	118
118.	Operculum conical or acuminate, longer than the calyx	119
	Operculum hemispherical, mostly blunt, usually shorter than the calyx	120
119.	Flowers shortly pedicellate, *E. redunca.*	
	Flowers sessile, *E. concolor.*	
120.	Leaf-veins fine, numerous, very divergent	121
	Leaf-veins not numerous, very oblique	122
121.	Stamens of expanded flowers, straight, *E. cneorifolia.*	
	Stamens of expanded flowers bent inwards about the middle, *E. uncinata.*	
	(*E. micranthera* is a variety of this.)	
122.	Peduncles conspicuously flattened near the top, *E. salubris.*	
	Peduncles nearly or quite terete	123
123.	Leaves under 3 inches long	124
	Leaves mostly over 3 inches long	125
124.	Fruit almost flat on top, *E. coccifera.*	
	Capsule somewhat sunk below the narrow rim, *E. Gunnii* (typical.)	
125.	Fruit topshaped, leaves somewhat undulate, *E. Gunnii*, var.	
	(I doubt whether Baron Von Mueller was correct in including this tree in *E. Gunnii* as a variety in his Eucalyptographia, where the main figure represents it. Bentham's description of *E. Stuartiana* refers partly to this. Perhaps it will be necessary to distinguish it as a separate species, and the name of *E. undulata* would not be inappropriate.)	
	Fruit ovate or globose, truncate	126
126.	Rim of fruit narrow, the valves inserted somewhat below it	127
	Rim of fruit rather broad and flat	128
127.	Flowers generally 3 in an umbel, *E. Bauerleni.*	
	(The real affinity is with *E. viminalis.*)	
	Flowers more than 3 in an umbel, *E. eugenioides.*	
	(The real affinity is with *E. piperita.*)	
128.	Leaves very pale, bark of stem hard and rugged, *E. Sieberiana.*	
	Leaves green, bark of stem smooth or fibrous ...	129
129.	Fruit ovate-truncate, top of fruit reddish, *E. haemastoma.*	
	Fruite globose, truncate or shortly ovate	130
130.	Leaves rather small, their oildots large and not very numerous; stem-bark fibrous, *E. amygdalina.*	
	(*E. dives* is an aberrant form of this. There is a variety in Tasmania with linear leaves.)	

No. No

Leaves large, their oildots very fine and numerous; stem-bark fibrous only near the base, *E. regnans.*

(Probably correctly included in *E. amygdalina* as a variety by Bentham and Mueller.)

131. Leaves small, thick, hardly inequilateral, *E. santalifolia.*

(Includes E. pachyloma).

Leaves mostly large, inequilateral 132

132. Stems of young plants and offshoots quite quadrangular, with opposite ovate bluish-white leaves, *E. Maideni.*

(I find the above the most striking character in this remarkable species. The typical specimens have rather numerous flowers in an umbel, clavate and smooth in bud, with hemispherical but pointed operculum, and a rather long flattened peduncle. But there are forms, especially specimens collected in Gippsland by Mr. A. W. Howitt, that show an unmistakable approach to E. globulus, which in its ordinary form has such a different appearance. In other respects there is an evident affinity with E. goniocalyx. All three species have in their young state quadrangular stems and bluish leaves; the adult leaves are also somewhat similar in shape and texture. In my opinion, there are weighty reasons against the assumption that we have here a case of hybridisation, but must rather ascribe it to evolution.)

Stems of young plants nearly terete... 133

133. Veins of leaves very oblique 134

Veins of leaves very diverging 136

134. Flowers and fruits sessile, *E. capitellata.*

Flowers and fruits on short pedicels 135

135. Operculum conical, *E. macrorhyncha.*

Operculum hemispherical, *E. Muelleri.*

136. Flowers mostly three in an umbel, *E. viminalis.*

Flowers more than three in an umbel 137

137. Operculum nearly hemispherical or shortly and bluntly conical 138

Operculum conical or acuminate 139

138. Leaves green, alternate, *E. Stuartiana.*

(Distinguished from E. viminalis when the latter has more than three flowers in an umbel by the fibrous bark and roundish seedling leaves, E. viminalis having either a smooth or a rugged but never fibrous bark and lanceolate seedling leaves.)

Leaves ashy-grey, sometimes opposite, *E. dealbata.*

139. Operculum mostly ending in a beak, *E. rostrata.*

(Some varieties have a blunt operculum and form a connecting link between this and E. tereticornis. E. exserta is a variety.)

Operculum conical, not beaked 140

No. No.

140. Bark smooth ; fruit almost globose through the broad ascending rim, *E. tereticornis.*

Bark rough ; rim of fruit only slightly ascending, *E. rudis.*

E. orbifolia and *E. patellaris*, enumerated in the "*Flora Australiensis*," I have omitted, as they have in my opinion been described from too imperfect material to make their recognition at all certain ; also *E. Lansdowniana*, F. v. Mueller and J. E. Brown, as I have neither a specimen nor the description, and as Professor Tate, who has seen the plant, informs me that he does not consider it a tenable species. Nor could I take cognisance of supposed new species described in recent years from cultivated plants in Europe and America, as it seems inconceivable that seeds of a number of new species should have been sent away while the trees remained unknown to Australian botanists.

INDEX.

INDEX—*continued.*

Sydney: William Applegate Gullick, Government Printer.—1898.