

NOTES ON AUSTRALIAN ORCHIDS.

A REVIEW OF THE GENUS CYMBIDIUM IN AUSTRALIA. I.

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(Four Text-figures.)

[Read 18th April, 1934.]

It was my purpose to attempt a review of one species only in this genus—the variable and perplexing *C. canaliculatum* R.Br.—but Dr. R. S. Rogers having suggested that all the known or alleged Australian forms of *Cymbidium* should be included, and having sent me valuable notes on the subject, I have endeavoured to comply. In addition to the assistance received from Dr. Rogers, I am greatly indebted to the following: The Government Botanists of Queensland and Victoria, the former for sending flowers of all forms represented in the Brisbane Herbarium, and the latter for the loan of all the specimens of *C. canaliculatum* in the Melbourne Herbarium; Mr. E. Nubling, Sydney, who went to a great deal of trouble to supply information from sources not accessible to me; Mr. W. F. Tierney, Cairns, who has forwarded generous supplies of living racemes of all North Queensland forms he could obtain; Mr. E. Cheel, Curator of the National Herbarium at Sydney, for useful notes; Messrs. W. H. Nicholls, F. A. Weinthal, Lieut.-Col. B. T. Goadby, and Mesdames C. A. Messmer and Edith Coleman. I must also mention Mr. C. Barrett, who brought to light what appears to be Mueller's *C. Hillii* when I had almost abandoned hope of any information about it.

For a long time past, difficulties have been encountered in connection with several Australian species. Of two of these, Fitzgerald's *C. gomphocarpum* and Klinge's *C. queenianum*, I have been unable up to the present to obtain any data whatever beyond the scanty information hitherto available. In regard to the supposed occurrence of *C. giganteum* Wall. in Australia (*Orchid Review*, Feb., 1928, p. 39, art. by E. Cooper), the evidence presented by the writer is that he had seen a plant of *C. giganteum* in flower in an English nursery, which had been "shipped from Sydney and so probably collected in Queensland." The above evidence is far from convincing in view of the fact that, so far as I can ascertain, no Australian botanist has ever recorded the occurrence within the Commonwealth of any member of the section *Iridorchis* to which *C. giganteum* belongs. In a fernery at Gosford, N.S.W., Mr. H. Cambourne has a *Cymbidium* which he secured from a collector who stated that it came from the Clarence River, N.S.W. This plant certainly belongs to no species hitherto recognized as Australian; and it may prove to be a member of the section *Iridorchis*, though I do not think it

is *C. giganteum*. Mr. Cambourne is endeavouring to trace its origin, and to ascertain whether or not it is really a native of the Clarence forests.*

Reference to early standard works on the Australian flora shows that the number of recognized species of *Cymbidium* has fluctuated. Robert Brown, in his *Prodromus*, described four—*C. canaliculatum*, *C. suave*, *C. reflexum*, and *C. pictum*. Lindley transferred the two last-named to the genera *Liparis* and *Geodorum* respectively. Brown alludes to a *C. squamatum* of Swartz, referring it to the genus *Dipodium*, of which it is a New Caledonian species. In 1839 Allan Cunningham (*Bot. Reg.*, 1839, Miscell. 34) described a species of *Cymbidium* from the Brisbane River, Queensland, under the name *C. iridifolium*. Now in 1832 Roxburgh (*Fl. Ind.*, 3, 458) had described an Indian orchid under this name, but it had been transferred by Lindley to his genus *Oberonia* (see Oakes Ames, "Orchidaceae", Fasc. I, 1905). *Oberonia iridifolia* is a small epiphyte recorded from India and Siam, through the Philippines, Malay Archipelago, and Australia, to Polynesia. It occurs in New South Wales. Cunningham's *Cymbidium iridifolium* is a very different plant, and his description is undoubtedly that of the species named by Mueller in 1859 *C. albuciflorum*. Why Cunningham's name was not recognized is not clear. In the year following his description, Lindley (*Bot. Reg.*, 1840, Miscell. 9) described a species under the name *C. madidum*, which appeared in publication as an East Indian plant. In 1889 R. A. Rolfe, wondering why it had never been recorded from the East Indies again during 50 years, examined Lindley's type and found it to be the Australian *C. albuciflorum* F.v.M. It seems strange that Lindley, who had transferred Roxburgh's *C. iridifolium* to the genus *Oberonia*, should have missed Cunningham's adoption of that name. It is clear, however, that Cunningham's description (which is quoted later in this review) is the earliest of the three which this *Cymbidium* received, and by the rule of priority we must abandon Mueller's name in favour of *C. iridifolium* Cunn.

Bentham (*Fl. Austr.*, vol. vi, 302) recognized only three Australian species—*C. canaliculatum* R.Br., *C. albuciflorum* F.v.M., and *C. suave* R.Br. Since then others have been described or reported, several of which have been reduced to varieties vaguely or not at all recognized. Two of the older species have proved so variable that identification has been rendered very difficult in view of their divergence from the original descriptions. In this review I have attempted to clear up the confusion which has resulted in regard to these forms.

Whatever may finally prove to be the number of valid species occurring in Australia, we may safely conclude that in future only such plants will be included as conform to the peculiar habit of life which we have come to associate with the genus *Cymbidium*. What is said on this point is based upon knowledge of Australian species only. Our *Cymbidiums* are commonly classed as epiphytes, but there is an important difference between their habit of life and that of our other epiphytes. *Cymbidiums* usually inhabit trees which from one cause or another have developed decay in the woody substance of trunk or branches.

* Since the above was written, this plant has proved to be the Indian *C. loweanum*. Mr. Paine, of Exotic Nurseries, Ltd., of Dee Why, N.S.W., writes that he discovered it, with other plants, near Stockyard Creek, an affluent of the Clarence. There was, however, strong evidence that the orchid had originally escaped from the plant-house of an old homestead, long demolished. Mr. Paine, who was trained at Kew Gardens, is of the opinion that it is not indigenous; and other non-Australian plants, including two ferns, were found near by.

A *Cymbidium* seed lodges in a crack, or in the cavity left by a rotted branch, and germinates there. The roots, which are succulent, but also strongly fibrous, penetrate into the hollow formed by decay; and finding their nourishment—no doubt chiefly through the agency of mycorrhiza—in the humus composed of decayed wood, gradually follow the line of decay down the hollow trunk or branch. Roots have been reported more than 30 feet in length, and I have seen a hollow branch completely filled by them. Since the hollows of trees are capable of retaining moisture for a long time, we have here the probable explanation of the fact that *C. canaliculatum* is able to flourish in dry and arid regions where one would not expect epiphytes. The explanation, however, does not account for the fact that this species is equally at home in the rain-forests from which its fellow-species rarely stray for any distance.

With the exception of *Dendrobium speciosum* Sm., *Cymbidium* plants attain greater dimensions than any of our other orchids; "clumps" of *C. canaliculatum* not infrequently weigh more than a hundredweight. Some are most prolific bloomers. I estimated the number of individual flowers on a large plant of *C. canaliculatum* which bore 103 racemes, at 6,183. The number of fertilized seed-capsules is relatively very small, 81 being the maximum counted in my own experience. As the capsules are large and the seeds are extremely minute, the number of seeds produced by 81 capsules baffles calculation. I have not been able to discover by what agents fertilization is effected, but it is safe to assume that insects are mainly responsible. Wind is almost certainly the chief agency of distribution. In the Pilliga Scrub, on the north-west plains of New South Wales, I found two very large clumps of *C. canaliculatum*. In both cases younger plants were plentiful for some distance, in the direction of the prevailing winds only.

The range is imperfectly known. No *Cymbidium* has been found in Tasmania, Victoria, South Australia, or the southern half of Western Australia. The majority of species are restricted to the rain-forests of Eastern and Northern Australia, from Mount Dromedary on the South Coast of New South Wales, at least as far as Roebuck Bay in the north-west of Western Australia. One species extends upwards of 200 miles inland.

In addition to the two species mentioned above (*C. gomphocarpum* Fitzg. and *C. queenianum* Klinge) concerning which I have been unable to procure particulars, the following species are recognized as valid in this review: *C. canaliculatum* R.Br., *C. Hillii* F.v.M., *C. Leai* Rendle, *C. iridifolium* Cunn., *C. suave* R.Br.

These will now be considered in detail in the order given.

1. CYMBIDIUM CANALICULATUM R.Br.

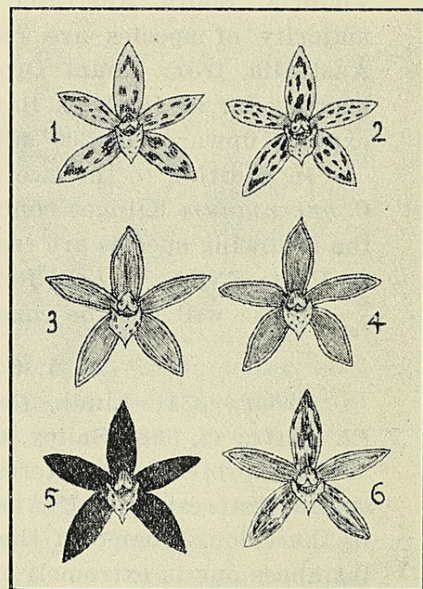
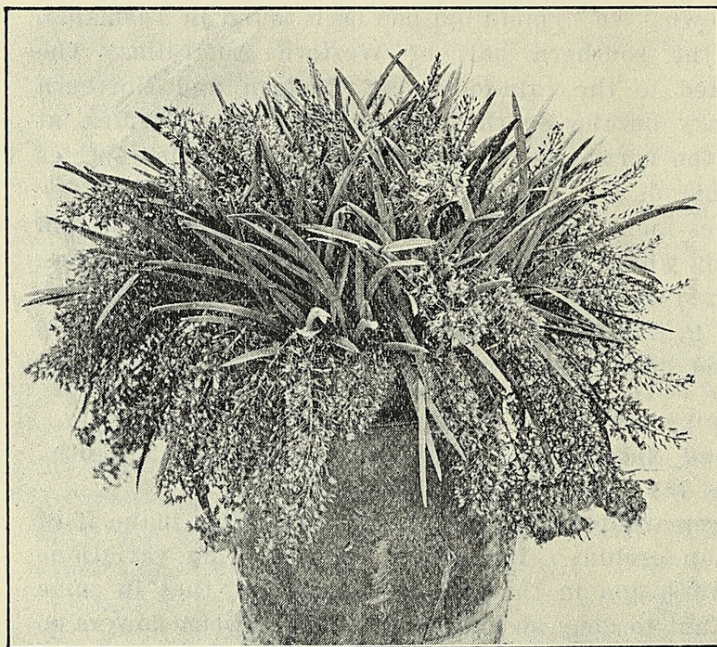
Prodr., 331; Lindl., *Gen. and Spec. Orch.*, 164; *Bot. Mag.*, t. 5851; Benth., *Fl. Austr.*, vi, 302; Bailey, *Q. Fl.*, 1547. (*C. Sparkesii* Rendle.)

The protean character and remarkable distribution of this species make it of special interest among Australian orchids. It exhibits such striking variations in the colour-scheme of the flowers, and in the colours themselves, that in some instances one is extremely reluctant to deny specific distinction between flowers so dissimilar in appearance. This dissimilarity has undoubtedly been the cause of confusion and perplexity. With the exception of A. B. Rendle, no botanist appears to have ventured to isolate any of these variants. Rendle took a spectacular North Queensland form with flowers of such intensely deep maroon as to appear jet black in reflected light, and erected it into a species under the name *C. Sparkesii* (*Journ. Bot.*, xxxvi, 221; and xxxix, 197). After careful

examination of living racemes sent by Mr. W. F. Tierney, of Cairns, in 1932 and 1933, I conclude that Bailey (*Q. Fl.*, 1547) is right in absorbing *C. Sparkesii* in *C. canaliculatum*. I can find no structural feature justifying specific separation, but it certainly seems that a form of such strikingly distinctive appearance should receive varietal recognition, and I propose to restore Rendle's name to varietal rank. Bailey further includes in *C. canaliculatum*, Rendle's *C. Leai*; but here I cannot follow him. *C. Leai* will be discussed later on.

It has been widely assumed that Robert Brown's type form of *C. canaliculatum* is represented in the coloured plate of *Bot. Mag.*, t. 5851 (1870). This plate shows flowers with the perianth segments externally almost greyish, internally bright brown with a narrow marginal border of pale green. The plant was collected by John Veitch at or near Cape York. It is a form which, so far as I can ascertain, is restricted to the far north of the continent. Mr. Tierney has sent living specimens from Cairns which agree with the plate, except that the exterior of the flowers is rather pale brown than grey. But I can find no evidence that Robert Brown collected the species elsewhere than at Broad Sound (see Benth., *Fl. Austr.*, vi, 302), more than 400 miles south of Cairns and more than twice as far from Cape York. Some of the dried flowers sent to me from the Brisbane Herbarium came from the neighbourhood of Broad Sound; and they agree very well, not with Veitch's form, but with one which is very abundant in southern Queensland and over large areas of New South Wales. This I believe to be the type, and Veitch's form will be treated here as a variety.

At this stage it may be well to refer to a point of some difficulty in Brown's original description of the species. He uses the expression "apice trilobo" of the



Text-fig. I.—*Cymbidium canaliculatum* R.Br.—A plant with 103 flowering racemes. (G. E. Geggie, photo.)

Text-fig. II.—*Cymbidium canaliculatum* R.Br. Flowers from the front, to illustrate the classification proposed in this paper. 1, Type, forma *inconstans*; 2, Type, forma *aureolum*; 3, Var. *marginatum*, forma *fuscum*; 4, Var. *marginatum*, forma *purpurascens*; 5, Var. *Sparkesii*; 6, an intermediate between 1 and 3.

labellum. Hooker (commenting on the plate in *Bot. Mag.*) remarks that Veitch's plant apparently differs from Brown's in having the labellum lobed about the middle, not at the apex. Now if we regard the apex of the so-called mid-lobe as the apex of the labellum itself, not only is Hooker's distinction justified, but Brown's expression describes a form of labellum which—as far as I can ascertain—is unknown in this species to any present-day observer. But it seems to me more likely that Brown, accepting the definition of the labellum as "trilobate", regards the point where lobation begins as the apex of the labellum proper—the portion in front of that point being merely the mid-lobe. If this interpretation of "apice trilobo" be adopted, Hooker's distinction disappears and the difficulty is dissolved. I venture to question whether we ought not to revise our conception of the labellum found in several *Cymbidiums* and *Caladenias* as "trilobate". The recognition of a mid-lobe seems artificial and unnecessary. In a labellum such as that of *C. canaliculatum* the impression obtained by examination is that of a continuous lamina with a small lateral lobe on either side. However, grant trilobation, and Brown is correct in locating the apex of the labellum proper at the point which Hooker considered the middle.

With a view to attempting some satisfactory tabulation of the outstanding variations in *C. canaliculatum*, I have examined some hundreds of specimens, living and dried, from many districts in New South Wales and Queensland, the Northern Territory, and the north-west of Western Australia. The need for such tabulation lies in the fact that, despite structural identity, the chief variants differ from one another so greatly in appearance as to suggest specific distinction at once. I am aware that to make colour-scheme and colour itself the bases for tabulation, is to invite challenge; yet in the present case I am convinced that this course is amply justified, and will serve to simplify questions of identity. I propose, therefore, to subdivide the species thus:

C. canaliculatum R.Br.

	1. TYPE.	
	(a) Forma <i>inconstans</i> .	
2. Var. MARGINATUM, var. nov.	(b) Forma <i>aureolum</i> .	3. Var. SPARKESII.
(a) Forma <i>fuscum</i> .		(<i>C. Sparkesii</i> Rendle.)
(b) Forma <i>purpurascens</i> .		

Before discussing these groups those features are described which they all possess in common. *C. canaliculatum* forms large "clumps" on trees, the numerous stems being short, densely packed together, and covered by the fibrous remnants of the bases of old leaves. At its growing end the stem is concealed by the appressed sheathing bases of the living leaves, which form with it an ovate pseudobulb. The leaves (3 to 6) range in length from 20 to more than 60 cm., and in breadth from 2 to 5 cm. They are thick, rigid, tough and fibrous in texture, usually acute at the apex, and deeply channelled along the ventral surface. The racemes (1 to 4 on a stem) are borne between or below the living leaves; maximum length about 40 cm.; number of flowers from 20 to 100. Capsules $4\frac{1}{2}$ —6 cm. long, scarcely half as broad, crudely resembling small bananas. In New South Wales the seeds do not ripen for many months. Flowers $2\frac{1}{2}$ — $3\frac{1}{2}$ cm. from tip to tip of fully expanded segments, petals slightly smaller than sepals. All perianth segments (including labellum) acute or obtuse,

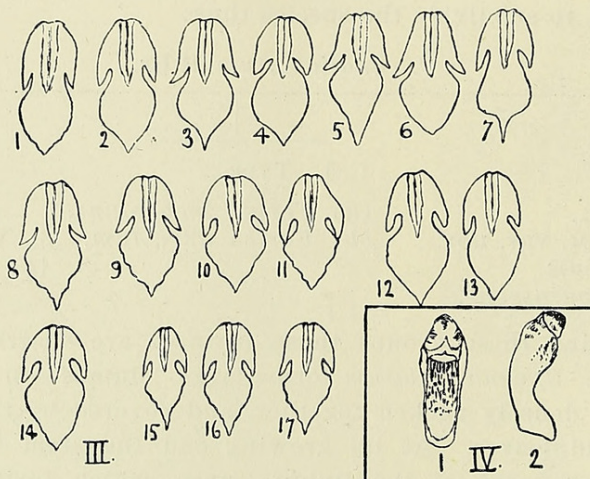
varying in this respect even on the same raceme. Labellum hardly as long as petals, consisting of a continuous lamina slightly dilated anteriorly (the "mid-lobe"), and with a small lateral lobe of varying contour on either side near the middle of the whole segment. Basal portion of lamina with 2 median longitudinal ridges, more or less ciliate in front, extending to the level of the lateral lobes. Column rather stout, usually loosely embraced by the lateral lobes of the labellum.

The slight variations from the above description are not sufficiently constant or important to merit notice. Only when we come to the distinctions of colour-scheme and colour itself, are we on safe ground in attempting to group the variants. It is in connection with the sepals and petals that these distinctions are most striking and most reliable. Certain forms have a colour-scheme quite different from that of others: within the unity of this scheme there may be diversity of actual colour. Except in var. *Sparkesii* the labella are not dissimilar to any great extent, and the exception is only one of colour.

1. The TYPE.—Sepals and petals outside brownish or green: inside, from dull to golden-yellowish-green, blotched, flaked, or spotted with brown or red. Labellum white with small purple or red markings: sometimes with suffusions of green.

(a) Forma *INCONSTANS*. This I believe to be the actual type as collected by Robert Brown.—Sepals and petals outside brown or green: inside dull to light green with heavy brown blotches or flakes. Labellum usually white with purplish dots. Sometimes the brown blotching has purple tints.

Range: Widely distributed from the Hunter River northward in New South Wales, from the coast to the western slopes (inclusive): spread over a corresponding area in Queensland at least as far north as Broad Sound. Possibly extending to the Northern Territory and the North-West; but while it is difficult



Text-fig. III.—*Cymbidium canaliculatum* R.Br. Outlines of labella to show variations. 1-7, Type, forma *inconstans*: 1, Cairns, Q.; 2, Rockhampton, Q.; 3, Brisbane River, Q.; 4, Tamworth, N.S.W.; 5-7, Hunter River, N.S.W.; 8, Type, forma *aureolum*, Pilliga, N.S.W.; 9-11, herbarium specimens referred to this form by the author: 9, Settlement Creek, Q.; 10, Roebuck Bay, W.A.; 11, Cambridge Gulf, W.A.; 12-13, Var. *marginatum*, f. *fuscum*, Cairns, Q.; 14, Var. *marginatum*, f. *purpurascens*, Brisbane River, Q.; 15-17, Var. *Sparkesii*: 15, Hughenden; 16, Mareeba; 17, Port Denison; all in Q.

Text-fig. IV.—*Cymbidium canaliculatum* R.Br. Column of Type. 1, Front; 2, Side.

to be sure of dried specimens, I am disposed to refer the Melbourne Herbarium flowers from those parts to the next following form.

(b) Forma AUREOLUM.—Sepals and petals outside almost bronze-hued; inside bright golden-yellowish-green with heavy red blotches or flakes, or red spots. Labellum purer white than in (a), with red dots or other marks. This form has a very distinctive appearance.

Habitat: Chiefly on the far western plains of New South Wales and Queensland; reported as far south as Forbes. Perhaps extending to the north-west of the continent: see under (a) above. Occasionally but rarely seen near the New South Wales coast.

2. Var. MARGINATUM, n. var.—Sepala petalaeque extra fusca vel glauca, intra immaculata, cum marginibus viridibus. Sepals and petals outside brownish or glaucous: inside unicoloured, with a narrow marginal border of light green.

(a) Forma FUSCUM.—This is the Cape York form (*Bot. Mag.*). Sepals and petals outside as described above: inside clear brown with light green marginal border (occasionally wanting). Labellum whitish with green suffusions and red spots.

Habitat (so far as at present known): Cape York southward at least as far as Mt. Garnet, Queensland.

(b) Forma PURPURASCENS.—Sepals and petals outside somewhat glaucous: inside, bright or deep magenta with light green margins. Labellum whitish with red or purple spots. What I have called "magenta" is viewed by one correspondent as cerise, by another as purplish-red. For the elucidation of some mystery about this beautiful form I am indebted to Messrs. W. H. Nicholls and F. A. Weinthal. I had seen it once in cultivation, and heard of it several times, but could not trace its habitat. Mr. Nicholls sent a colour-sketch of a flower received from Mr. Weinthal, which I recognized at once. Mr. Weinthal informs me that he obtained plants from the head of the Brisbane River in Queensland. I have since received another definite record of it from Mr. K. Macpherson, Proserpine, North Queensland.

3. Var. SPARKESII (*C. Sparkesii* Rendle).—Sepals and petals wholly intensely-deep maroon, appearing black except when viewed by transmitted light. Labellum pink with a green base and crimson spots, or with heavy suffusions of dark red.

Habitat: Queensland coastal forests north of Townsville, and probably in some other areas of the tropics. Specimens sent to me by Mr. Tierney (Cairns) originally came from Mareeba. A Hughenden specimen in the Brisbane Herbarium seems to belong to this form, to which I am also disposed to refer flowers in the Melbourne Herbarium collected by G. F. Hill at Borroloola, N. Aust. Though not the most beautiful, this is the most striking form in the species, its jet-black appearance in reflected light giving it an almost uncanny aspect. Rendle remarks (*loc. cit.*) on the weird impression of its sombre hue in its habitat.

In the Sydney Herbarium there is a specimen from Lismore, New South Wales, labelled *C. canaliculatum*, which is rather puzzling. The general appearance of the raceme is typical, but the labellum suggests an approach to *C. iridifolium* Cunn., and the leaves are very similar to those of the latter. Living material of this plant is very desirable. A white-flowering form of *C. canaliculatum* has been reported from several districts: in one instance my informant had it growing and sold it. I have been unable to obtain any specimens, and can do no more than record the reports.

C. canaliculatum has a strong tendency to produce abnormal flowers; "double" flowers are frequently seen, and I have one which is really a compound of four. The four labella are all perfect. In these compound flowers a lateral sepal of one is often joined back-to-back with a similar segment of another.

It must be understood that the varieties and forms named above are, at least in some instances and possibly in all, more or less connected by intermediates. Thus Mr. Tierney has sent a Cairns raceme which might be placed either in the form *inconstans* of the type, or in the form *fuscum* of var. *marginatum*; even in individual flowers, one or two segments suggest the latter, while the others agree better with the former. Similarly, the two forms of the type occasionally approach one another very closely.



Rupp, H M R. 1934. "Notes on Australian orchids. A review of the genus *Cymbidium* in Australia. I." *Proceedings of the Linnean Society of New South Wales* 59, 93–100.

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