

NOTES ON AUSTRALIAN ORCHIDS. V.*

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(Eleven Text-figures.)

[Read 27th November, 1946.]

I. A REVIEW OF THE GENUS *Calochilus* R.Br.

This genus was established by Robert Brown in 1810 (*Prodromus*, 320). Its affinities are obscure. Brown placed it at the end of his second Section of the Orchidaceae, immediately after *Neottia australis*—now known as *Spiranthes sinensis* (Pers.) Ames. The first genus in his next Section was *Microtis*. Benthams (*Fl. Aust.*, vi, 314) placed *Calochilus* between *Spiranthes* and *Thelymitra*; while F. M. Bailey (*Qd. Fl.*, v, 1585) put it between *Glossodia* and *Chiloglottis*. In Pfitzer's arrangement of the Orchidaceae, as given in Torre and Harms, *Genera Siphonogarum Enscripta* (1900–1907), it stands between *Acidnthus* and *Eriochilus*. Clearly, then, there has been much difference of opinion as to its rightful position. So far as the habit and general conformation of the plants are concerned, there is much in common between *Calochilus* and *Thelymitra*; immature plants may easily be confused. The flowers, however, differ widely in their morphology, although the anomalous *Calochilus imberbis* Rogers might perhaps be considered to constitute something like a link between the two genera.

Though it cannot be said to have any bearing on the position of *Calochilus*, it may not be out of place here to call attention to the curious superficial resemblance between the South African orchid *Disa lugens* Bolus and a *Calochilus*. The former is illustrated in Bolus's *Orchids of the Cape Peninsula* (1918 ed., t. 87), and at first glance, the resemblance is very striking. There is actually no close affinity; the "beard" in the flower of *D. lugens* is formed by numerous fine incisions along the margins of the labellum, while in a *Calochilus* flower it consists of densely-massed, metallic-lustrous hairs. Nevertheless the resemblance is remarkable enough to constrain one to ask why so similar a form of flower should be evolved by orchids only remotely related, and separated by 5,000 miles of ocean. No other species of *Disa* figured by Bolus shares in the likeness.

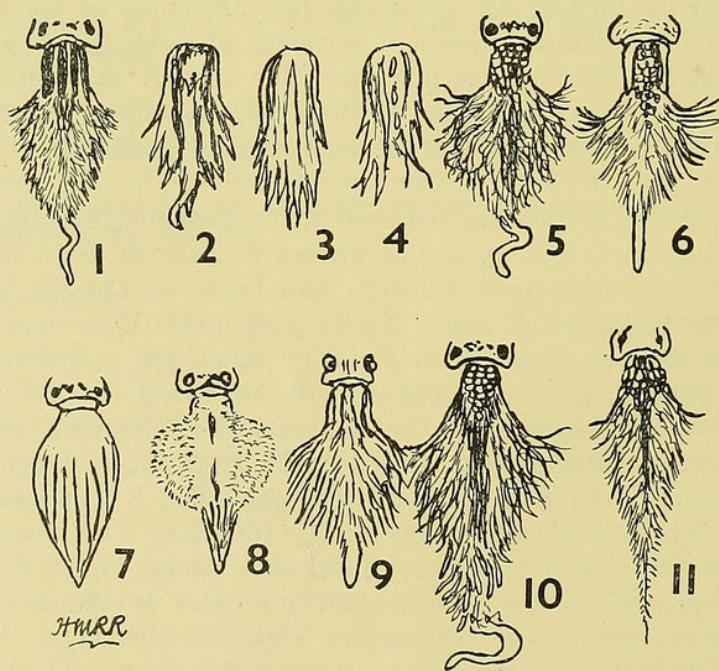
For many years *Calochilus* was believed to be endemic in Australia: but although apparently Australian in origin, it is now known to have at least one representative in New Caledonia (*C. neocaledonicus* Schltr.), and three or four in New Zealand—three of the known Australian species, and a fourth still under investigation. Robert Brown described only two species—*C. campestris* and *C. paludosus*. (References to the descriptions of species subsequently established will be found in the list following this paragraph.) Sixty-three years after the publication of Brown's *Prodromus*, Benthams added a third species, *C. Robertsonii*: and in 1892 F. Mueller described *C. Holtzei* from the Northern Territory. In 1918 R. S. Rogers published *C. cupreus* as a new species; but subsequently this proved to be specifically identical with Brown's *C. campestris*. In 1927 the same author described a new Victorian species under the name *C. imberbis*, in allusion to the absence of the metallic-lustrous hairs so characteristic of the genus. This was followed two years later by another Victorian species, *C. Richae* Nicholls. In 1930 Rogers described *C. saprophyticus*, a remarkable form, the description of which was later amplified and illustrated by Nicholls. In 1934 Rupp described *C. grandiflorus*, which was followed nine years later by the same author's *C. gracillimus*.

* Continued from these PROCEEDINGS, Vol. 69 (3-4), 1944, 73-75.

Including *C. neocaledonicus*, then, ten species are now recognized. The distribution of these, as far as it is at present known, is as follows:

1. *C. campestris* R.Br. All Australian States except Western Australia; also in New Zealand.
2. *C. paludosus* R.Br. Same range as No. 1.
3. *C. Robertsonii* Benth., *Fl. Aust.*, vi, 1873, 315. All Australian States and New Zealand.
4. *C. Holtzei* F. Muell., *Bot. Centr. Alb.*, 1, 1892, 127; and *Vict. Nat.*, viii, 1892, 80. Northern Territory.
5. *C. imberbis* Rogers, *Trans. Roy. Soc. S. Aust.*, li, 1927, 4. Victoria.
6. *C. Richae* Nicholls, *Vict. Nat.*, xlv, 1929, 233. Victoria.
7. *C. saprophyticus* Rogers, l.c., liv, 1930, 41; and Nicholls, l.c., lix, 1943, 158. Victoria; Tasmania? (see note below).
8. *C. grandiflorus* Rupp, *Vict. Nat.*, 1, 1934, 239. Southern Queensland and north coast of New South Wales.
9. *C. gracillimus* Rupp, l.c., lx, 1943, 28, and in *Orch. N.S.W.*, 1943, Plate vii. New South Wales.
10. *C. neocaledonicus* Schltr., Engler's *Bot. Jahrb.*, xxxix, 1907, 43. As this species is endemic in New Caledonia, it will not be referred to further. I have not seen a specimen.

1. *C. campestris*.—The plant figured by R. D. Fitzgerald over this name in *Aust. Orch.*, i, 4, is not Brown's species, but accurately represents the pale-flowered form of *C. Robertsonii* Benth. The finest illustration of *C. campestris* known to me is that in Curtis's *Bot. Mag.*, 1832, t. 3187. The plant there depicted was a Tasmanian specimen. In *Vict. Nat.*, lviii, 1941, 94, there is an excellent black-and-white plate by Nicholls in which he shows the curious variations of the labellum. After the publication of *C. cupreus* by Rogers in 1918, I was puzzled by finding that nearly all New South Wales specimens which came into my hands, supposedly as *C. campestris*, appeared to agree very closely with the new species. It looked almost as if Brown's species had disappeared. Later on I became convinced that these two really were not specifically distinct, confusion having been caused by the imperfectly known variations in *C. campestris*. I then learned that Nicholls had reached the same conclusion in Victoria, and was about to publish the result of his investigations.



Figs. 1-11.—Labella and column-bases of various species of *Calochilus*. 1. *C. campestris*. 2-4. Variations in the posterior portion of the labellum of *C. campestris*. 5. *C. Robertsonii*. 6. *C. paludosus*. (Note absence of columnar glands.) 7. *C. imberbis*. 8. *C. Richae*. 9. *C. saprophyticus*. 10. *C. grandiflorus*. 11. *C. gracillimus*. (2, 3, 4, 7, 8 and 9 partly after W. H. Nicholls.)

2. *C. paludosus*.—This is adequately figured by R. D. Fitzgerald, l.c., though certain details lend themselves to misapprehension (see my *Orch. N.S.W.*, 1943, note on p. 52). The specific name chosen by Brown is not particularly appropriate, for this plant is not specially addicted to swampy ground. The finest specimen I have ever seen—a plant 90 cm. high with 15 flowers—was collected by me in a dry scrub on the South Maitland coalfields. Apart from the brilliant red of the labellum hairs, *C. paludosus* may usually be readily distinguished from other species by the wide expansion of the petals and lateral sepals: the dorsal sepal is often conspicuously cucullate.

3. *C. Robertsonii*.—This is the only species which is known to extend to Western Australia. The colour of the metallic-lustrous hairs varies from peacock blue to purple or purplish-red, but occasionally plants are found with pale green or greenish-white flowers. This peculiarity is shared by *C. paludosus* and *C. grandiflorus*. Bentham named the species in honour of J. G. Robertson of Wando Vale, in western Victoria; but he invariably mis-spells "Wando" as "Wendu". Robertson was a Scot who emigrated to Tasmania in 1831, and for some years he was manager of the Formosa Estate there. He was a friend of Ronald Gunn, who collected so assiduously for J. D. Hooker during the preparations for his "*Flora Tasmaniae*". Robertson left for Victoria in 1840, and settled at Wando Vale near Casterton. Sharing his friend Gunn's enthusiasm for botany, he collected extensively along the Glenelg River and its affluent, the Wando, and also about Portland. When he finally returned to Scotland he gave his herbarium to Sir William Hooker at Kew, where Bentham had access to it.

4. *C. Holtzei*.—I have seen no specimen of this. As little appears to be known about it, I give here Baron von Mueller's description published in the *Victorian Naturalist*, March, 1892.

"Lower calyx-lobes ovate-lanceolar, a quarter of an inch long, upper one broader, verging into deltoid-roundish form; petals obliquely lanceolar-elliptical, fully as long as the calyx-lobes. Perianth light greenish-brown. Labellum twice as long as the other lobes, rhomboid-ovate, greenish, above densely beset and ciliolar-fringed with reddish hairs, but glabrous at the deltoid apex. Near the middle of the base, two straight vertical dark-blue plates with prominent striae between them, but devoid there of glandules or protruding cross-lines. Column as in other species. Height to three feet. Flowers to twenty."

This description appears to confuse the base of the labellum with that of the column; it is the latter, not the former, which would be "devoid of glandules or protruding cross-lines". Apparently the dark gland at the base of each side of the column, which is so conspicuous in most species, is absent in *C. Holtzei* as it is in *C. paludosus*. The unusual length of the petals, and the deltoid apex to the labellum, are other distinctive features.

5. *C. imberbis*.—This may truly be termed an anomalous member of the group, since it lacks the very *raison d'être* of the generic name, which alludes to the beautiful adornment of the labellum by its metallic-lustrous glandular hairs. The labellum of *C. imberbis* is quite glabrous. Rogers follows up his description of the species with the following remarks: "The flowers, though not so regular as in the genus *Thelymitra* Forst., show an approach to actinomorphy which is very unusual in orchids. The lip is distinctly petaloid; but the lateral petals retain the shape which is common to all known species of *Calochilus*."

The type locality is Rushworth, in the mid-north of Victoria. The discoverer of this peculiar species was Mrs. F. Rich, whose name is commemorated in the next species. Subsequently *C. imberbis* was found by Mrs. Edith Coleman at Ringwood, on the eastern outskirts of Melbourne.

6. *C. Richae*.—This was discovered by Mrs. Rich at Whroo, which may be considered as portion of the Rushworth area. It differs from the typical *Calochilus* almost as strikingly as *C. imberbis*; for the labellum, although not glabrous, is clothed with hairs so short as to constitute a mere pubescence. It is very differently shaped from that of *C. imberbis*, the pubescent portion being almost orbicular. Up to the present there is no record of the occurrence of *C. Richae* beyond the type locality, and it appears to be very rare, though found in sufficient numbers to warrant specific rank.

7. *C. saprophyticus*.—As indicated above, the original description by Rogers of this curious and interesting species has been amplified and illustrated by Nicholls (*Vict. Nat.*, lix, 1943, 158). If Nicholls's plate be compared with that in Hooker's *Flora Tasmaniae*, ii, t. 106A (over the name *C. campestris* R.Br.), I think the specific identity of the two plants will be found fairly obvious. Compare, again, this plate of Hooker's with that cited above (under *C. campestris*) from Curtis's *Botanical Magazine*. It can scarcely be maintained that they represent the same species. This explains why, in the records of distribution given above, I have credited *C. saprophyticus* with extension to Tasmania, but with a note of interrogation, since it has not been recorded there under that name. I believe that Hooker's plate does represent this species, and that it will be found again in Tasmania. Morphologically, it is close enough to *C. campestris* to be mistaken for a form of that species; but the stem is yellowish, and the leaf scarcely differs from the stem-bracts. The root-system resembles that of *Prasophyllum flavum* R.Br., the irregularly-shaped tubers being accompanied by several fleshy rhizomes. The species has been recorded from three widely-separated areas in Victoria—Cravensville (north-east), Anglesea (central-western), and Portland (extreme west).

8. *C. grandiflorus*.—Though not usually a robust plant, this species has the largest, and perhaps the most beautiful, flowers in the genus. The deep reddish-purple hairs massed on the lower half of the labellum are in very striking contrast to those on the anterior portion, which are translucent and sparkling with papillae. Whether *C. grandiflorus* is identical with the form which Bentham named *C. campestris* var. *grandiflora* (*sic*), is a question which could only be settled by comparing it with the specimens he cites; but it certainly cannot be included in *C. campestris*: its affinities are rather with *C. Robertsonii*. But it is sufficiently distinct from any other form to stand on its own merits as a species. It occurs along the coast of southern Queensland, extending inland as far as Stanthorpe; and also, sparingly, along the north coast of New South Wales, its southern limit apparently being about the Myall Lakes. It grows in bogs or swampy ground. The flowering period is from late October through November.

9. *C. gracillimus*.—This latest addition to the species of the genus is also the latest to flower, appearing about Christmas time. It is a very slender form in all its parts, and the labellum is exceptionally long. The reddish-purple hairs often extend nearly to the summit of the filiform tip of the labellum. The columnar glands are not united by a ridge or coloured band, and each has a short, dark venule entering it at the top and the bottom. *C. gracillimus* is recorded from Woy Woy, Gosford, and the Blue Mountains, all in New South Wales.

R. D. Fitzgerald was of the opinion that *C. campestris*, *C. paludosus*, and other forms known to him, were self-fertilized. As, however, he was mistaken in his interpretation of *C. campestris*, his remarks on that species really apply to *C. Robertsonii*. We now know that *C. campestris* R.Br. is pollinated by the agency of the flower-wasp *Campsomeris* (*Dielis*) *tasmaniensis*. The whole process was carefully watched by Mr. and Mrs. F. Fordham at Brunswick Heads in northern New South Wales, in September, 1945; and the results of their observations were published (*Vict. Nat.*, lxii, 1946, 199). Fordham's statements leave no room for doubt on the matter. Whether the species is entirely dependent on the wasp, or is sometimes self-fertilized, is another question. It is worth noting that Fordham says the wasps paid no attention whatever to flowers of *C. Robertsonii* which were mixed with those of *C. campestris* during the two days of observation. The hairs on the labellum of the former are more densely massed than in the latter species. If, however, the dense "beard" of a *Calochilus* labellum is intended to repel insects, why is it so brilliantly coloured? One would also like to know whether the two "beardless" species, *C. imberbis* and *C. Richae*, are self-fertilized, or by what insect agency pollination is effected.

II. *ACIANTHUS CAUDATUS* R.Br. var. *PALLIDUS*, n. var.

Planta 7–10 cm. alta, cum floribus viridis aut flavoviridis. Flores plerumque 2. Sepalum dorsale erectum, 20 mm. longum, pilatum cuspidate filiforme; margines anteriores plicati. Sepala lateralia anguste linearia, patentia, 13 mm. longa. Petala linearia,

patentia vel deflexa, 5 mm. longa. Labellum rhombolanceolatum apice recurvo, calli basales truncati. Columna magnopere exserta.

Plant 7–10 cm. high, green or yellowish-green, including the flowers. Flowers usually 2. Dorsal sepal erect, 20 mm. long, spear-shaped with a filiform point, the margins plicate upwards. Lateral sepals narrow-linear, spreading, 13 mm. long. Petals linear, spreading or deflexed, 5 mm. long. Labellum rhomboid-lanceolate, with an acute recurved tip; the two basal calli blunt. Column bent forward almost at right angles.

Cronulla, New South Wales, viii.1926 (E. Nubling). Smithton, north-western Tasmania, x.1946 (the type: Miss Mary Atkinson).

This is an interesting form, of which I have recently been able to make a critical examination from living plants forwarded by Miss Atkinson. Mr. Nubling's specimen in my herbarium, collected at Cronulla twenty years previously, agrees with the Smithton plants in all respects. The typical *A. caudatus*, though variable in size, sometimes attains a height of 16 cm., and may bear as many as six flowers, which are deep purplish-red or purplish-brown: the dorsal sepal is often more than twice as long as in the new variety. In my opinion the latter is strongly suggestive of a natural cross between *A. caudatus* and *A. exsertus* R.Br. Three characteristics in particular support this view: (1) colour, (2) the relative shortness of the sepals, (3) the extreme exertion of the column. As against this hypothesis, *A. exsertus* flowers in the autumn and *A. caudatus* in late winter and spring. I have, however, on rare occasions seen them flowering together (Port Jackson bushlands). But whatever its origin, the form described above is sufficiently distinctive to merit at least a varietal name.

III. *CALADENIA CARNEA* R.Br. vars. *MINOR* and *EXIGUA*.

These two forms, originally described for New Zealand as *C. minor* Hook. f. and *C. exigua* Cheesmn., respectively, are not uncommon in Australia, and are now known as *C. carnea* var. *minor* (Hook. f.) Hatch and *C. carnea* var. *exigua* (Cheesmn.) Rupp. Both have the essential characters of *C. carnea*, the variations of which were discussed by the present writer in these PROCEEDINGS, lxxi, 1946, pp. 278–81. Both have quite recently been recorded in the northern suburban area of Sydney. But for its occurrence in New Zealand, where the larger forms of *C. carnea* are unknown, I doubt whether *C. carnea* var. *minor* would ever have been singled out for varietal rank, for it is in Australia linked up with larger forms by abundant intermediates. *C. carnea* var. *exigua*, however, is far more distinctive, the solitary marginal callus at the base of the midlobe on each side, and the entire margin of the lobe in front of the callus, rendering it easily recognizable. The lateral lobes of the labellum in the Sydney flowers are coloured bright rose. I am indebted to Capt. J. D. McComish of Wahroonga for calling my attention to this form.

C. carnea var. *minor*: Berowra and Cowan, New South Wales, ix.1946 (A. R. and H. M. R. Rupp).

C. carnea var. *exigua*: Wahroonga, New South Wales, ix.1946 (D. Connolly).



Rupp, H M R. 1947. "Notes on Australian orchids. V." *Proceedings of the Linnean Society of New South Wales* 71, 287–291.

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