dimensions, and for having been collected by a modest person.

Early this year I went to Christchurch to absorb a periodical dose of sophistication and came upon a new structure in the botanical gardens known as the Alpine House. On entering I was dazzled by a pot of gold and then by four more. Five superb pots full of my MODESTA. My heart glowed with pride and then I remembered. Modest person be hanged — another West Coast legend exploded.

Photo: R. J. Chinnock.

Bulbophyllum tuberculatum on rimu branch, associated with *Pyrrosia serpens* and lichens. Note *B. pygmaeum* bottom centre.

Notes on *Bulbophyllum tuberculatum* (Orchidaceae)

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ON 25th May 1968 a colony of *B. tuberculatum* was discovered on a limb torn from an old rimu by the storm of the 10th April. This rimu emerges above a canopy of kohekohe-tawa forest about 40 ft high, on a 350 ft ridge to the north of Paraparaumu.

There was quite a community of orchids scattered along the fallen branch — all epiphytic species except *Earina autumnalis* and the doubtful *"E. aestivalis"* were there. *Bulbophyllum tuberculatum* tended to occur higher up the smaller branches than the other orchids, in positions where it would be partly or entirely shaded by the rimu foliage overhead. No asteliads were on this branch. The orchids derived their nourishment from a thin layer of material built up from rather sparse patches of *Pyrrosia serpens*. *Bulbophyllum tuberculatum* seemed to prefer positions where this fern was on the wane, but before the fibre thus laid bare had been occupied by crustose lichens. The accumulation of peaty material would be slow at this height. It was augmented a little, however, by a few small rotting stubs of rimu branches and tiny pieces of rimu foliage.

The pseudobulbs are arranged sympodially on a rhizome which runs above, or is slightly embedded in, the substratum. Roots which emerge from the rhizome and occasionally from the bases of pseudobulbs are no thicker than those of *B. pygmaeum* but much longer — sometimes extending to about 10 cm. They are sometimes sparingly branched. Apparently they can grow over bare bark if the atmosphere is not too dry. Pseudobulbs in all stages of development were present, but it was not noted whether the roots were growing or dormant at the time of discovery. A few juvenile plants of various sizes were dotted about the branches.

The turgid or finely wrinkled pseudobulbs, especially when young, bear upon their surfaces fine white mealy scales which probably protect the underlying tissue from excessive light while it is developing. This covering gradually weathers away but persists longest near the top of the pseudobulb. It is seemingly not composed of scales attached by their bases to the epidermis, but rather is derived from the breaking up of one or two membranous sheathing leaves which tightly cover each pseudobulb in its infancy. As each tiny fragment breaks away it appears somewhat bullate for a while before shrinking up into scattered mealy specks. The sheathing leaves are therefore most obvious on the

younger pseudobulbs, from the tops of which their apices curve outwards a little. Sometimes the apex of the inner sheathing leaf is faintly photosynthetic for a while.

The thinly coriaceous leaves tend to be narrow-elliptic to -lanceolate or -oblanceolate in outline. Each leaf is folded upon itself where it joins the pseudobulb to form a small false petiole which is capable, especially when young, of twisting to orient the rest of the lamina in relation to the light. The glabrous dorsal surface has a fine median groove. Ventrally it is either faintly keeled or has a darkish midrib. This surface is peppered thickly with minute whitish specks which, to the naked eye, look like a faint silvery grey film. Where the plant in growing in strong light a purple pigment is developed which is especially noticeable on the ventral leaf surfaces, peduncles, and developing capsules. Indirect light seems to be preferred.

Small inflorescences are produced from the bases of pseudobulbs, whence they reach a position about half the height of the leaves, if these are vertical. A second spike may develop from the base of an earlier one. The peduncles persist as dry brownish threads. Only one complete flower, partly open, was seen, and it agreed with Colenso's description in *Trans. N.Z. Inst.* 22, 1890, p.488 quite well. (The drawing in Cheeseman's *Illustrations of the N.Z Flora* Vol. 2, 1914, Plate 191 depicts the flowers with the corollas *open,* which may or may not be accurate.) Seen from the front, the sepals formed a little hood over and about the labellum which presented its upturned ventral surface to view. This was red, fading to yellow in the middle.

This colony had sufficient numbers of individuals for one to see that it could adapt to different microclimates. Some plants on exposed branches had smaller, suborbicular pseudobulbs, with correspondingly reduced leaves carried more or less horizontally. In one place some pendent lichens of the *Usnea* type had become entangled amongst the orchid leaves. The affected plants had produced ovate pseudobulbs up to about 11 × 7 mm, and the leaves were more parallel-sided and measured up to 27 × 5 mm. They were held vertically so that only their tips protruded through the lichen. Plants in this condition could produce flowers under or within the lichen.

From its well-lit perch 50—60 ft up in the rimu the colony had been plunged to the gloom of the forest floor, where it had remained for six weeks until found. If *B. tuberculatum* were very sensitive to environment one might expect this to have had some traumatic effect. However it appeared to have weathered the misfortune as well as any of the other species present, which strengthens the impression it gives of being tough and adaptable. Why then is it so uncommon?

The present plants were certainly not conspicuous. Colenso's specimen sent from Palmerston North in April 1889 (loc. cit.) was described as forming "pretty large and closely matted masses", but this was probably enjoying much less spartan conditions than the Paraparaumu plants. Colenso first described this orchid from preserved material obtained near Petane *(Trans. N.Z. Inst.* 16, 1884, p. 336) and gave the lamina as "thickish but not fleshy", a description which he confirmed later. In Cheeseman's *Manual of the N.Z. Flora* (1925) we read "leaves ½—1 in., thick and fleshy". This, if correct, suggests a specimen from a much less xerophytic habitat than the present ones, some of which gave the impression of being near the limits of tolerance to exposure.

One factor limiting its spread is its own growth form. All specimens seen were spot-bound as a result of the very short internodes on the rhizomes. These are much shorter than the diameter of the pseudobulbs, resulting in plants which are more tightly tufted and prone to being overwhelmed by other epiphytes than those of *B. pygmaeum*. Also, an older plant has an outer zone of vigorous growth surrounding an inner area of leafless, dying pseudobulbs with senescent or moribund roots. Any new growth emerging from a "backbulb" would be forced up into the air above the closely packed old pseudobulbs about it. It would prosper only if a fresh layer of organic material was deposited over these old pseudobulbs, and this is not likely to occur on the top of an old rimu. The only escape from these restrictions is by seeding and germination in fresh localities. *Bulbophyllum tuberculatum* seems to be more seral than the other epiphytic orchids, though in circumstances not conducive to rapid succession (as they might well not be on exposed rimu branches) a colony could persist for many years.

No plant was seen growing in fibre more than about half an inch thick. This fibre is what an orchid grower would call "dirty", i.e. much of it was decomposed into a very fine black material. Epiphytic orchids rarely take kindly to this sort of growing medium which, if present in too great a volume, will cause their roots to die prematurely. *Bulbophyllum tuberculatum* seems to avoid this by colonizing only thin and better drained patches of this material, but in so doing exposes itself to the peril of greater desiccation.

All plants seen seemed free of any serious disease. The remains of a few narrow oval white scale insects were found on the undersides of some leaves, and a few tiny lichens were present on some of the older pseudobulbs. Several plants had been overwhelmed by crustose lichens.

It would be interesting to hear of any other recent discoveries of this orchid, and whether anyone has successfully maintained it in cultivation.