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VARIATIONS IN FLORAL STRUCTURE OF LAELIOCATTLEYA FLORINE BALL

By
D. T. EKANAYAKE
(Royal Botanical Gardens, Peradeniya)

INTRODUCTION

LAELIOCATTLEYA Florine Ball (Fig. 1) is a hybrid raised at the Royal Botanic Gardens, Peradeniya, and dedicated to the wife of an eminent Botanist, Sir Nigel Ball, one time Professor of Botany of the University of Ceylon. This hybrid was made by crossing *Cattleya lueddemanniana* (female parent) with *Laeliocattleya Golden Gate* (male parent) on 10th January, 1951. The seeds were sown by Mr. E. de Saram on 1st September, 1951. The hybrid first flowered in January, 1960, and it was registered at the International Authority for the Registration of Orchid Hybrids in November, 1960. This hybrid is not a striking novelty, but it is a robust grower which is reasonably resistant to the common diseases in the *Cattleyas* such as Black Spot and Collar Rot. Observations made at the Royal Botanic Gardens, Peradeniya, have shown that this plant can resist rain to a great degree proving its usefulness as an orchid suitable for outdoor culture under partial shade.

A survey of the hybrid progeny has revealed the existence of marked variations among the individuals and this forms the subject matter of the present paper.

GENEALOGY

The genealogy of *Laeliocattleya Florine Ball* is shown in Fig. 2. It will be seen that this hybrid has the following well known *Cattleya* and *Laelia* species in its ancestry:—

- Cattleya bicolor* Lindl.
- C. dowiana* Batem. l. c.
- C. lueddemanniana* Reichb. f.
- C. warscewiczii* Reichb. f.
- Laelia crispa* Reichb. f.
- L. purpurata* Lindl.
- L. tenebrosa* Rolfe.



Figure 1.—*Laeliocattleya Florine Ball*.

All the *Cattleya* species with the exception of *C. bicolor* belong to the 'labiata' group characterised by the presence of a single leaf per pseudobulb, and a lip which is trumpet-shaped and the lateral lobes are folded over the column. *Cattleya bicolor*, on the other hand, belongs to the 'bifoliate' group. It has two leaves per pseudobulb and the lip is tongue shaped and devoid of lateral lobes. The lips of the three *Laelia* species too are trumpet-shaped. The heritage of the hybrid includes *C. dowiana* seven times, each of *C. bicolor*, *C. warseewiezii*, *C. lueddemanniana* and *Laelia tenebrosa* twice and each of *Laelia crispa* and *L. purpurata* once.

BOTANICAL DESCRIPTION

The pseudobulbs range from 30.0 to 48.5 cms. in height. They are club-shaped, slightly flattened, basally attenuated and covered with whitish membranous sheaths. In the majority of the plants in the progeny, each pseudobulb is provided with a single leaf, but in a few, the pseudobulbs are bifoliate. The leaves are 16.5 to 26.5 cms. long and 3.5 to 5.0 cms. broad. They are oblong-lanceolate in shape and have obtuse apices.

In transverse section (Fig. 3) the leaf shows an upper and a lower epidermis. Each of these is provided with a thick cuticle. The stomata are sunken in pits in the lower epidermis. The cells of both the upper and the lower epidermis are small and are rectangular in cross section. Below the upper epidermis is a layer of transversely flattened cells. The mesophyll is faintly differentiated into palisade and spongy tissues. The palisade consists of about three layers of vertically elongated more or less rectangular cells. The spongy mesophyll has large more or less flattened cells which are closely packed. The hypodermal cells, the palisade and spongy mesophyll contain chloroplasts. The vascular bundles are poorly differentiated and each has a bundle sheath enclosing the xylem and phloem.

The inflorescence is mostly 2-flowered and rarely 3-flowered. The bracts are broadly ovate and are provided with acute apices. Each is about 2 mm. long. The sepals are oblong-lanceolate or lanceolate-spathulate. Their apices are acute or emarginate and are green in colour. The colour of the sepals is purple (H. C. C. Orchid purple 31/3, 31/2) or bronze-purple or sometimes purple suffused with pale greenish yellow. The dorsal sepal is 5 to 7.5 cms. long and 1.5 to 2.0 cms. broad. The lateral sepals are sometimes bowed towards the centre and they are as long and as wide as the dorsal sepal.

The petals are ovate-oblong and have acute apices and undulated margins. They are 6 to 7 cms. long and 3.5 to 5 cms. broad. The

petals are either purple (H. C. C. Orchid purple) or bronze-purple. The shape of the lip is variable. It may be trumpet-shaped or have the lateral lobes reduced to varying extents. The margin of the front lobe is crisped and 2-lobed. The lip is deep purple in colour (H. C. C. Orchid purple, 31) and sometimes it is streaked with golden yellow or has a golden blotch in the centre. In some, the margin of the front lobe is white. The stamen has four pollinia.

VARIATIONS IN THE STRUCTURE

There are hardly any characteristic variations in the vegetative structure among the members of the progeny. The only noteworthy variation is the existence of two types of pseudobulbs. In the majority of the plants, the pseudobulbs are unifoliate, but in a few, the pseudobulbs are bifoliate. On the other hand, the variations in the floral structure are very remarkable in the hybrid progeny.

Sepals.—In the hybrid progeny, two distinct variations in the outer perianth segments or sepals have been observed. In the majority of plants, the sepals are oblong-lanceolate and acute (Fig. 4, A) but in some they are lanceolate-spathulate and emarginate or praemorse (Fig. 4, B). In oblong-lanceolate forms, the apical margin is green. The lateral sepals are either spreading or arched towards the centre. The colour of the sepals range from purple through purple suffused with greenish-yellow to bronze-purple.

Petals.—The shape of the petals is fairly uniform but their colour is variable. They may be purple or bronze-purple.

Lip or Labellum.—Of the floral parts, the lip exhibits the greatest diversity in structure. In certain plants, the lip is folded over the column and forms the trumpet-shaped structure characteristic of the 'labiata' section of the Cattleyas. Fig. 5, A-H shows the variations in the shape of the lip of the hybrid progeny. The normal trumpet-shaped lip is illustrated in Fig. 5, A. On the other extreme, certain plants have lips whose lateral lobes are extremely reduced (Fig. 5, H). The intermediate types (Fig. 5, B-G) show gradual loss of the lateral lobes. Parallel with the reduction of the lateral lobes, there is a reduction in the size of the front lobe. The lip illustrated in Fig. 5, H resembles closely the lip of *Cattleya bicolor*.

DISCUSSION

Adams (1959) assumes that the broken trumpet type of lip is derived from the trumpet-shaped lip by the loss of tissues at the edges. She cites evidence from the lip shapes of the progeny, from

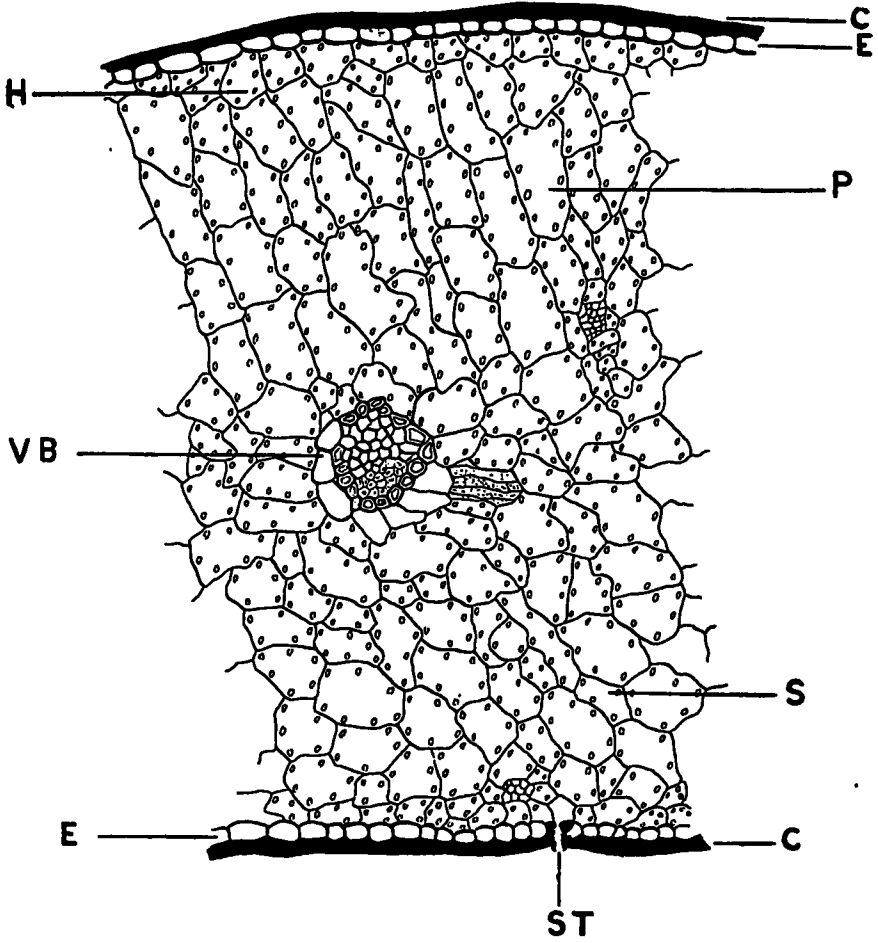


Figure 3.—Transverse section of the leaf of *Laeliocattleya Florine* Ball C, cuticle ; E, epidermis ; P, Palisade ; S, spongy mesophyll ; VB, vascular bundle ; ST, stoma ; H, hypodermis.

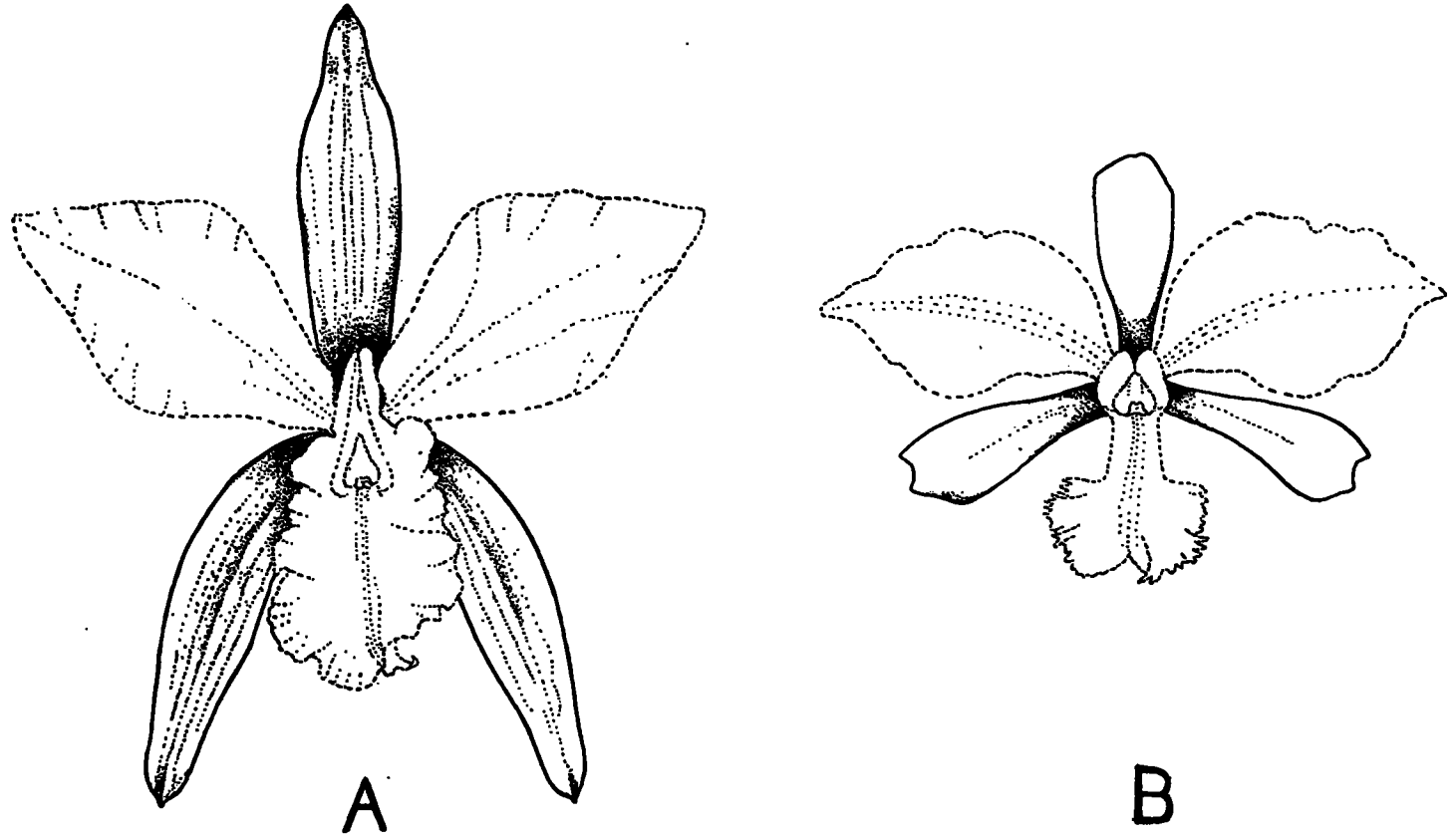


Figure 4.—A & B, Variation of the shape of the sepals in *Laeliocattleya Florine Ball*.

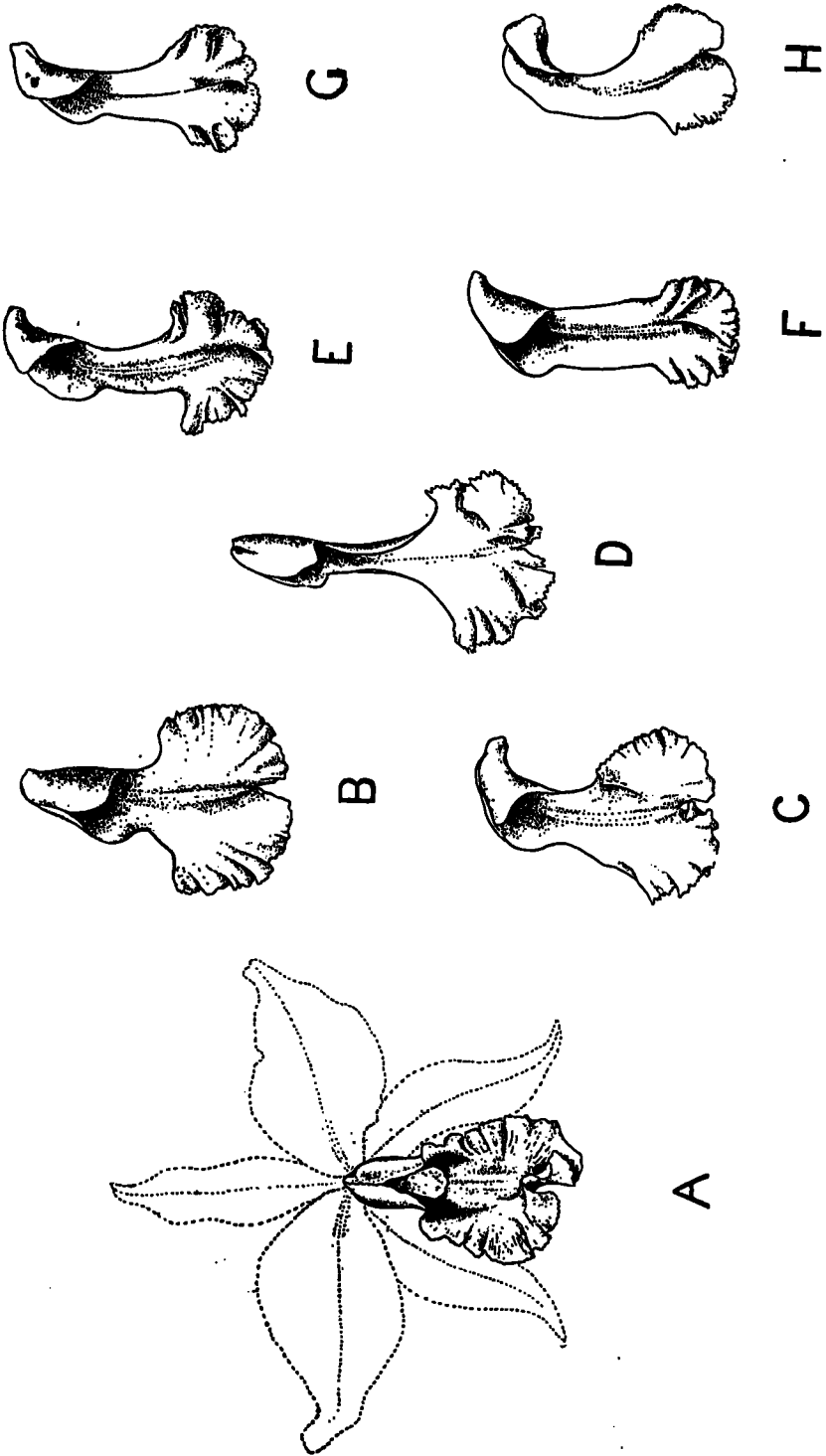


Figure 5.—A - H, Variations in the lip of *Laeliocattleya Florino Ball*.

parents belonging to the 'labiata' and the 'bifoliate' Cattleyas. The progeny in such crosses shows lip forms which approximate those of the parents together with intermediate forms which resemble broken trumpet-shaped lips of other species and genera. The *Cattleya* species in the ancestry of *Laeliocattleya* Florine Ball with the exception of *C. bicolor* belong to the 'labiata' section and they all possess the trumpet-shaped lip. *Cattleya bicolor* on the other hand has a unique lip devoid of lateral lobes. It is said that this character is inherited by its hybrid progeny (1956). Since *Laeliocattleya* Florine Ball is a hybrid between *C. bicolor* and *Cattleya* species of the 'labiata' section together with *Laelia* species possessing trumpet-shaped lips, it is natural to expect in the progeny lip forms which approximate those of the parent species together with a variety of intermediate forms.

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