NEW SPECIES AND VARIETIES OF ORCHIDACEAE FROM HONG KONG

SHIU-YING HU AND GLORIA BARRETTO

One hundred and nine species of orchids are known from Hong Kong. This number appears surprisingly large for an area of 404 square miles. However, it agrees with the nature of the general flora of the area, for the area:species ratio of Hong Kong is much higher than the average calculated by DeWolf for areas of similar size and latitude[1]. The ecological diversity, geological history, and climatic conditions support a very rich flora in Hong Kong.

The residents of Hong Kong have always had an economic or intellectual interest in the orchids of the area. Since time immemorial, the fishing, hunting, or farming population wandered in the forests or to the grassy slopes of the hilltops to look for the tubers of *Nervilia* and *Spiranthes,* the rhizomes of *Goodyera* and *Ludisia (Haemaria),* the pseudobulbs of *Bulbophyllum*, and the entire plants of *Arundina, Dendrobium* and *Pholidota* for medicine.

As an expression of intellectual curiosity of the natural history of Hong Kong the early western residents sent living or dry specimens or paintings of the flowering orchids to London. These had become the types of many species described by Lindley. *Eria sinica* Lindl., *E. rosea* Lindl., *Acampe multiflora* Lindl. and *Diploprora championii* (Lindl.) Hook. f. are some examples. From 1873 to 1883, Hance sent manuscripts about orchids in Hong Kong to be published in London. *Bulbophyllum ambrosia* (Hance) Schlechter and *Cleisostoma fordii* Hance are some examples. From the 1880s onward, Charles Ford sent living and herbarium specimens of orchids from Hong Kong, Kwangtung and Hainan to Kew, and the undescribed species were published by Rolfe. *Acanthephippium sinense* Rolfe, *Ania hongkongensis* (Rolfe) Tang & Wang, *Liparis macrantha* Rolfe, *Thelasis hongkongensis* Rolfe and *Tropidia hongkongensis* Rolfe are some examples.

The first person who worked on the orchids of Hong Kong, published his observations in a local scientific journal, and aroused the interest and won the collaboration of the Chinese intelligentsia was Dr. G. A. C. Herklots, formerly of the University of Hong Kong. One of his collaborators was Mr. J. L. Youngsaye, a teacher of mathematics and physics. In the 1930s Youngsaye had amassed a considerable living collection and took excellent photographs of approximately 80 species at the flowering stage. The pictures indicate that some of the material represented undescribed species. Unfortunately this collection was destroyed in the war of the early 1940s. However, Youngsaye's pictures and his knowledge of the habitat of the native species are indispensable for the revival of interest in orchids of Hong Kong.

At present there is a loosely organized group for the study of native orchids of Hong Kong. It has approximately ten members who share specimens, photographs and field observations. This report contains the findings of the undescribed species which flowered in nature or in cultivation. It represents our observation and collaboration for a period of eight years. It contains 13 new species, 2 varieties, and one color-form: **Peristylus spiranthes** (Schauer) S. Y. Hu, comb. nov., **P. spiranthes** var. **taipoensis, Spiranthes hongkongensis, Manniella hongkongensis, Goodyera foliosa** (Lindl.) HK. f. var. **alba, Goodyera youngsayei, Cheirostylis jamesleungii, C. monteiroi, C. clibborndyeri, Malaxis allanii, M. parvissima, Liparis ruybarrettoi, Phaius tankervilliae** (Banks) Bl. f. **veronicae, Ania ruybarrettoi, Bulbophyllum youngsayeanum, Cirrhopetalum tseanum,** and **Gastrochilus holttumianus.**

With the lack of botanic literature and reference collections we often ran into difficulties in identifying our species. Through correspondence, we have been able to obtain help required for solving our problems. We are deeply indebted to the

[1] DeWolf, G. P. Jr. On the size of floras. Taxon 13: 149-154. 1964. S. Y. Hu. Sea-shore Plants of Hong Kong. Journ. Chin. Univ. HK. 2: 331. 1974.

[2] CUH = Chinese University Herbarium.

following orchidologists for their assistance: Professor R. E. Holttum, former Director, Botanic Gardens, Singapore, now at Kew, England; Mr. Peter Taylor, Head of the Orchid Section, Herbarium, Royal Botanic Gardens, Kew; Professor T. Tang, Institutum Botanicum, Academiae Sinicae, Peking, and Dr. F. G. Brieger, Piracicaba, SP. Brazil. We should like to take this opportunity to express our appreciation to them all and to Professor J. F. Leroy, Director, Laboratoire de Phanerogamie, Museum National d'Histoire Naturelle, Paris for checking the holotype of *Spiranthes sinensis* (Pers.) Ames, and to Mrs. Teresa Fung Wong, Botanical Artist, Herbarium, The Chinese University of Hong Kong, for the illustrations.

Peristylus Blume

Peristylus spiranthes (Schauer) S. Y. Hu, *comb. nov.*

Choeradoplectron spiranthes Schauer in Nov. Act. Acad. Caes. Leop-Carol. **19 (Suppl. 1):** 436. t. 13. fig. C. 1843.

Peristylus chloranthus Lindl. in Journ. Bot. Kew Misc. **7:** 37. 1855.

Habenaria lacertifera Benth., Fl. Hong K. 362. 1861.

Habenaria meyenii Merr. in Journ. Arn. Arb. **18:** 67. 1937.

Schauer's specific epithet is the earliest legitimate name for the species. It is valid in *Peristylus,* though not so in *Habenaria* on account of *Habenaria spiranthes* Reichb. f. *Peristylus spiranthes* (Schauer) S. Y. Hu is the correct name of the species.

Peristylus spiranthes var. **taipoensis** Hu et Barretto, var. nov. (Figure 1).

A typo differt floribus candidis, lobis lateralibus labelli deltoideis.

HONGKONG: New Territories, Taipo. *S. Y. Hu 10944* (Holotype K; Isotype A) August 23, 1970, along partially shaded woodland path, flowers white, lip lobes short, only midlobe slightly curved down; *S. Y. Hu 10851* (A, K, US) August 16, 1970, flowers white, the spur oblong-obtuse, the lateral lobes of the lip triangular-ovate; *S. Y. Hu 7906* (A, CUH, K, US) September 21, 1969, flowers white, by a ditch in forest.

This variety is found in the New Territories at elevations of 100–800 metres. It shares the same habitat with *Peristylus spiranthes* var. *spiranthes.* It is distinguished by its white flowers with the lateral lobes of the lip broad triangular. In this respect it resembles *Peristylus goodyeroides* (D. Don) Lindl. which has a globose spur and a very different column. In *P. spiranthes* var. *spiranthes* the flowers are green and the lateral lobes of the lip are lanceolate-caudate and coiled at the apices.

Specimens from Taipo show variations in the spur and the lateral lobes. In *S. Y. Hu 10944* (Fig. 1.B_1), the spur is ovoid and acute at the apex, the lobes of the lip are short with only the midlobe slightly recurved. In another specimen *S. Y. Hu 10943* (Fig. 1.B_2) August 23, 1970, the spur is more pointed at the apex, and the lobes of the lip are larger, turning downward. In yet another specimen *S. Y. Hu 10945* (Fig. 1.B_3) August 23, 1970, the spur is obtuse, and the lobes are of intermediate length.

Spiranthes L. C. Richard

Spiranthes hongkongensis S. Y. Hu et Barretto, sp. nov. (Figure 2. B-F).

Herba terrestris; foliis linearibus, 4–12 cm. longis, 5–9 mm. latis, acutis; inflorescentiis spicatis, rachibus bracteis ovario et sepalis glanduloso-villosis.

Perennial terrestrial acaulescent orchid. *Root* fleshy, white, 1.2–6 cm. long, 1.5–3.5 mm. in diameter, covered with hair-like structures. *Leaves* basal, 2–6, linear, young ones unfolding from one side, mature ones oblanceolate, gradually attenuating to a sheath-like petiole; laminas 4–12 cm. long, 5–9 mm. wide, apex acute, the midrib faintly grooved above, elevated beneath. *Scapes* 10–42 cm. long, the lower portion glabrous, gradually becoming hairy, bearing 3–5 green sterile bracts, 1 leaf-like, 6–9 cm. above the basal ones, with a sheathing petiole, 1.5–4 cm. long, lamina linear or lanceolate, 3–7 cm. long, 4–6 mm. wide, the smaller ones 8 mm. to 4 cm. long, sheathing below, the free portion acuminate,

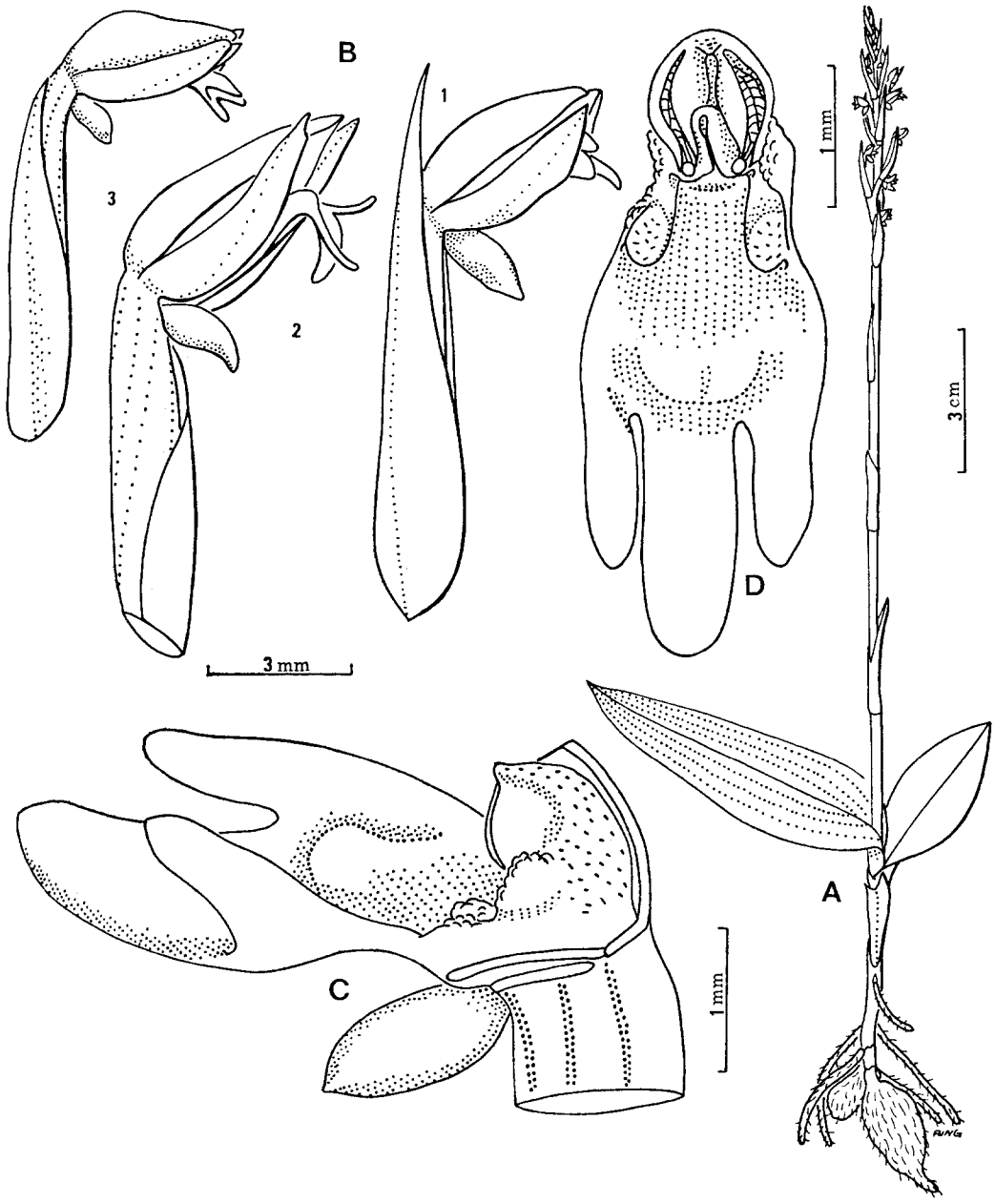

Figure 1. *Peristylus spiranthes* var. *tatpoensis:* A. The habit sketch of a flowering plant showing the tubers, the fibrous roots, the sub-basal leaves, and the flowering scape. B. The lateral view of 3 flowers showing variation in the size of flowers, the length of the bracts, the lateral lobes and midlobes of lips, and the spurs. C. The lateral view of a flower with all the sepals and petals removed, showing the 3-lobed lip with a callus at the middle, an oblong-conic spur pointed at the apex, and the very short column with lateral glands. D. The front view of a flower with all the sepals and petals removed, showing the 3-lobed lip with a central callus, the column with lateral glands and parallel thecae, the folded rostellum, the lateral stigmas, and the orifice of the spur.

5–7 mm. long; *flowers* numerous, resupinate, sessile, spirally arranged in a hairy spike; bracts green, 5–6 mm. long, very sparsely glandular-hairy, cymbiform, lanceolate-acuminate; *sepals* glandular-hairy, the odd one dorsal, white, oblong, 4 mm. long, 1.5 mm. wide, the apex obtuse; the lateral ones white or slightly tinged pink, 4 mm. long, 1.5 mm. wide, the margin slightly curved inward; *petals* glabrous, similar to the odd sepal in size, shape and colour and in close contact with it, forming a roof; *lip* neither calcarate nor saccate, the basal portion thickened, with a transparent spherical gland, large for the size of the flower, on each side at the base, disc hairy, the apical portion rounded and curved slightly downward at the apex, the margin crisped and silvery white; *column* very short, 1 mm. long, clavate, the apical end enlarged, transparently white dorsally, green ventrally, triangular at the apex; *anther* on a distinct filament, brownish black, ovate; *pollinia* 4 in 2 pairs, powdery; *rostellum* narrow, delicate, membranous, truncate and entire, attached to the middle of the pollinia in close contact with the stigma; *stigma* shield-like, the upper margin trilobed; *ovary* 4 mm. long, densely glandular-hairy.

HONGKONG: Victoria Peak. *Kit Yok Chan 1023* (CUH) April 7, 1973, side of road near seepage, flowers white to pink. NEW TERRITORIES: Kadoorie Farm & Gardens. S. Y. Hu 13179 (CUH) March 29, 1973, flowers white, ovary pilose, stigma tricuspidate, pollinia attached at middle, no evident viscid disc; *S. Y. Hu 13553* (CUH) March 26, 1975, flowers white, petals tinged pink, stigma shield-like, trilobed at apex, covered by a sticky mass securely attached to the middle of the pollinia, no sign of bilobed rostellum or viscid disc; additional material of same plant, April 4, 1975, new flowering shoots developed and flowered two weeks after the original scape was removed. Kowloon Reservoir. *S. Y. Hu 10035* (A, CUH) April 26, 1970, flowers white, ovary very hairy. Sek Kong (nr. Yuen Long). *C. K. Wun 51* (CUH) April 22, 1962, growing along the little stream near Sek Kong Village, soil muddy. Shatin, Chung Chi College, near Chapel. *S. Y. Hu 13548* (CUH) March 15, 1975, flowers white, sepals and ovary glandular-hairy, inside of lip of the first opened flowers not hairy, the remaining ones hairy on the disc, stigma shield-like, trilobed on the upper margin, with the middle lobe attached to the lower portion of the fleshy pollinia. Siu Lek Yuen, Shatin. *S. Y. Hu 13552* (CUH) March 26, 1975, collected by students of The Chinese University of Hongkong, glandular hairs on rachis, bracts, sepals and ovary, flowers white, occasionally the petals tinged pink, stigma shield-like, trilobed on the upper margin, glossy all over, associated with a thin membrane attached to the middle of the pollinia, no bilobed rostellum. Taimoshan. *S. Y. Hu 13550* (CUH, A, HK) March 25, 1975 (collected by Tse Shing Chee), bracts, ovary and sepals glandular-hairy, stigma shield-like, glossy, trilobed at the apex, associated with a thin membrane adhering to the middle of the pollinia. Taipo, garden of Gloria Barretto. *S. Y. Hu 13658* (Holotype K; Isotype A, CUH), April 4, 1975, flowers white, rachis, bracts, ovary and sepals glandular-hairy, without viscidium, a sticky mass connecting stigma and lip.

For seven years (1969-1975), we have made observations on the species of *Spiranthes* in Hongkong. By examining numerous specimens of fresh material, it was discovered that we have two distinct elements: one has a glabrous rachis, bracts, ovary and sepals, discoid stigma, and an ovate-truncate rostellum, acuminate and bilobed at the apex with a viscidium between the lobes (Fig. 2. A, G—K), the other element has a glandular-hairy rachis, bract, ovary and sepals. It has a membranous, narrow, truncate rostellum attached to the middle of the pollinia, without any evidence of a viscid disc. Its stigma is shield-like and trilobed on the upper margin (Fig. 2. B-F).

The first person who wrote about *Spiranthes* in our general area was Loureiro, who was stationed in Macau and Canton for many years. In 1790, he described *Aristotelia spiralis,* which was later transferred to *Spiranthes* and is now recognised as *Spiranthes sinensis* (Pers.) Ames. With the help of Professor J. F. Leroy, we were able to ascertain that Loureiro's material represents the glabrous element. From Peter Taylor, we received copies of original descriptions of various species for checking

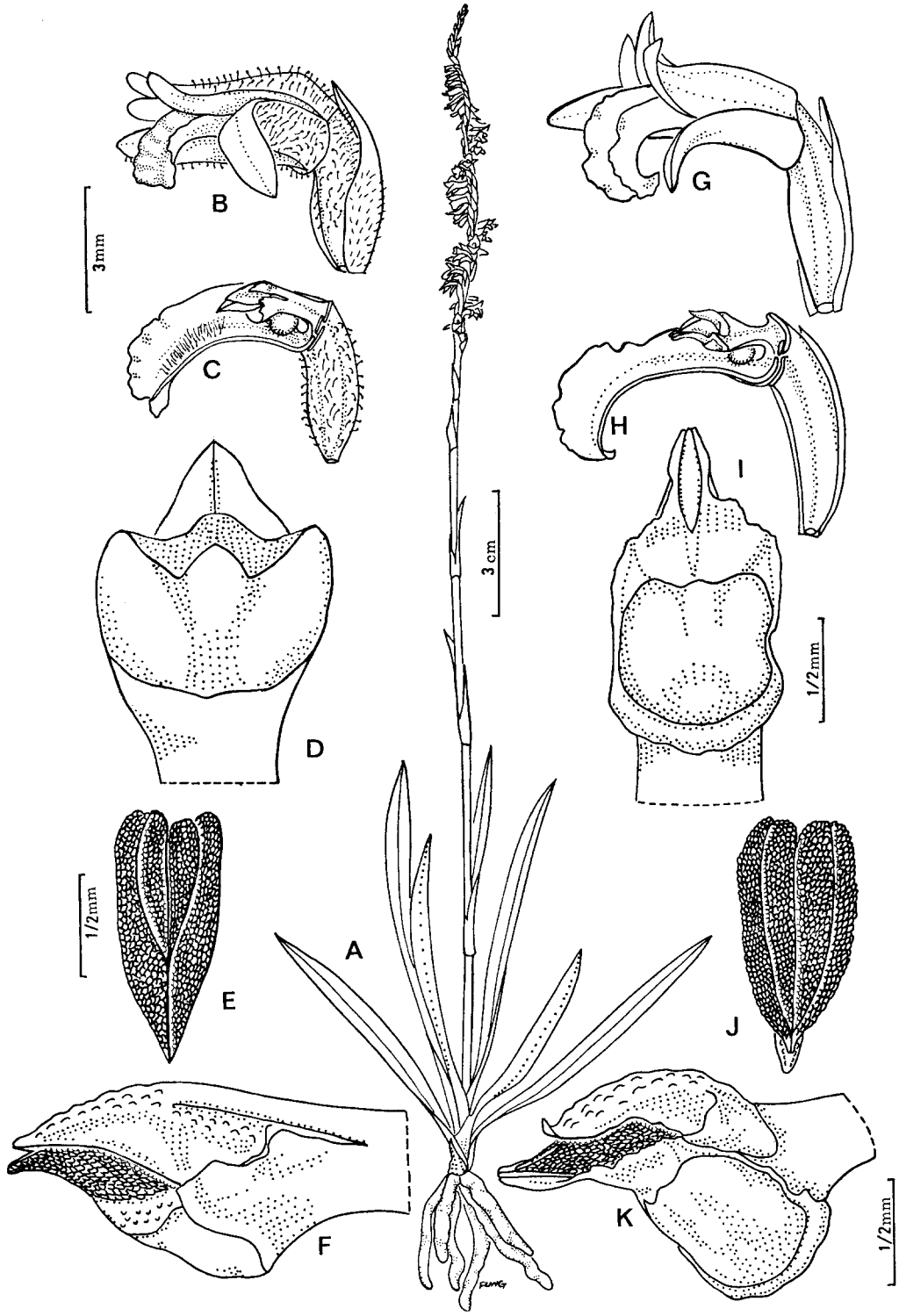

Figure 2. *Spiranthes:* A. The habit sketch of a flowering plant of *S. sinensis,* showing a fascicle of fleshy roots, linear basal leaves, and a flowering scape with spirally arranged flowers in a spike. B-F. *Spiranthes hongkongensis:* B. The lateral view of a flower with glandular hairs on the ovary and sepals. C. The lateral view of a flower with dorsal sepal, lateral sepals, 1 petal, and one-half of the lip removed, showing a spherical callus on one side at the base and the hairs on the disc of the lip, the column with an anther above and the stigma beneath. D. The front view of an apical portion of the column showing the middle of two pollinia, a very narrow hyaline rostellum attached to the middle of the pollinia, and the shield-like stigma trilobed along the upper margin. E. Four pollinia in 2 pairs, without evident viscidium. F. The lateral view of the apical portion of the column showing the pollinia, and the stigma attached to the middle of the 2 larger pollinia. G-K. *Spiranthes sinensis:* G. The lateral view of a flower showing the glabrous ovary and sepals. H. The lateral view of a flower with dorsal sepal, lateral sepals, 1 petal, and one-half of the lip removed, showing a spherical callus at the base and no hair on the disc of the lip, and the column with anther cap, pollinia, and stigma. I. The front view of the apical portion of the column showing the forked rostellum, the elliptic viscidium, and the oblong stigma. J. Four pollinia in 2 pairs attached to distinct elliptic viscidium. K. The lateral view of the apical portion of the column, showing the anther deep into the clinandrium, the rostellum bifurcate at apex, and the stigma.

the nomenclatural problems in connection with *Spiranthes sinensis.*

We now name all the glabrous material *Spiranthes sinensis* (Pers.) Ames. The hairy element requires a new name, which is proposed here as *Spiranthes hongkongensis* S. Y. Hu et Barretto.

Spiranthes hongkongensis prefers damp but well drained sunny localities. It occurs at both low and high elevations. Generally the scapes are 15–30 cm. high bearing 10–30 flowers. In favourable environmental conditions, such as at Kadoorie's Orchid Haven, and along banks of streams in the mountains north of Plover Cove Reservoir, specimens with scapes 60 cm. high bearing 45–60 flowers have been observed.

The flowers of *S. sinensis* last approximately for a week, with the ovaries remaining slender. The flowers of *S. hongkongensis* wither within 3 days with the ovaries enlarging very quickly after anthesis. The lack of viscidium, the pollinia remaining in the clinandrium, and the rapid enlargement of the ovaries seem to indicate the apomictic development of the seeds in *S. hongkonensis.* This condition corresponds to Swamy's report of apomixis in *S. cernua.*

Manniella Schlechter

Manniella hongkongensis S. Y. Hu et Barretto, sp. nov. (Figure 3).

Herba terrestris; foliis oblongo-ellipticis, 3.5–6.5 cm. longis, 1.5–3.5 cm. latis, acutis; racemis terminalibus; floribus parvis; sepalis basi connatis; labello carnoso, concavo, papilloso, basi unguiculato, utrinque in appendicem producto; columna elongata, tubo perianthii adnata; polliniis 2; stigmatibus 2; ovario glandulo-piloso.

A terrestrial orchid with a resting period during the dry winter season. *Root* 4 or more, fleshy, finger-like, fusiform, 1–7 cm. long, 0.5–1 cm. in diameter, covered with woolly hairs. *Rhizome* very short, 3 mm. long and wide, bearing roots at the lower portion and leaves (decayed at anthesis) at the upper portion, with 2 small white buds covered by brown scales destined for developing into the scape and leafy shoot. *Scape* initiated at the apex of the short rootstock, surrounded by the fibrous remains of decayed old leaves, cylindrical, stiff, 12–15 cm. long, 2–3 mm. in diameter, the basal portion white, gradually turning greenish above, bearing 7 sheathing cataphylls, the lower 2 showing greenish lamina, 7 mm. long, 3 mm. wide, the other 5 progressively narrower, the upper ones subulate, 10 mm. long, 1 mm. in diameter, the green portion sparsely covered with glandular hairs; *rachis* 4 cm. long, hairy like the scape; flowering bracts 7–11 mm. long, linear-lanceolate, subcymbiform, sparsely hairy; *flowers* 5–18, resupinate, shortly pedicellate, arranged spirally in loose formation on the rachis, small, inconspicuous, 3 mm. in diameter at the widest portion; *perianth segments* greyish green with a creamy white lip, all parallel with the column and ovary, obtuse at the apex; *sepals* glandular-hairy, the odd one dorsal, 4 mm. long, 1.5 mm. wide, with 3 veins, slightly concave at the base, lateral sepals 2/5 connate at the base, forming a funnel-like pouch, united dorsally to the basal portion of the column and ventrally to the narrowed base of the lip, with the free portion of the lateral sepals raised up along a single, median longitudinal line; *petals* 4 mm. long, 1 mm. wide, parallel with the dorsal sepal; *lip* papillose, very fleshy, green at the base and creamy white at the apical portion and slightly curved downward, the lower portion forming a fairly deep groove, the margin shallowly crinkled, the veins green, the sides extending backward into 2 fleshy, papillose lateral appendages pointing toward the ovary, each hooked at the apex; *column* short, the base united with the petals and the sepals forming the papillose roof of the pouch, the apical portion ovoid, on the back bearing the fertile anther in the middle and 2 staminodes, 1 on each side (Fig. 3, H), the lower portion beak-like, forming the clinandrium, the bilobed rostellum, and the 2 sublateral stigmas (Fig. 3, I–J); *anther* lanceolate, 2 mm. long, lying above the apical projection of the column and attached to it by a short filament; *pollinia* 2, subparallel, granular, folded dorsally, each attached to a dark grey viscid disc (Fig. 3, J–K); *rostellum* ovate, unequally forked at the apex, the shorter one slightly overlapped by the longer one; *stigmas* 2, sublateral, slightly uneven; *ovary*

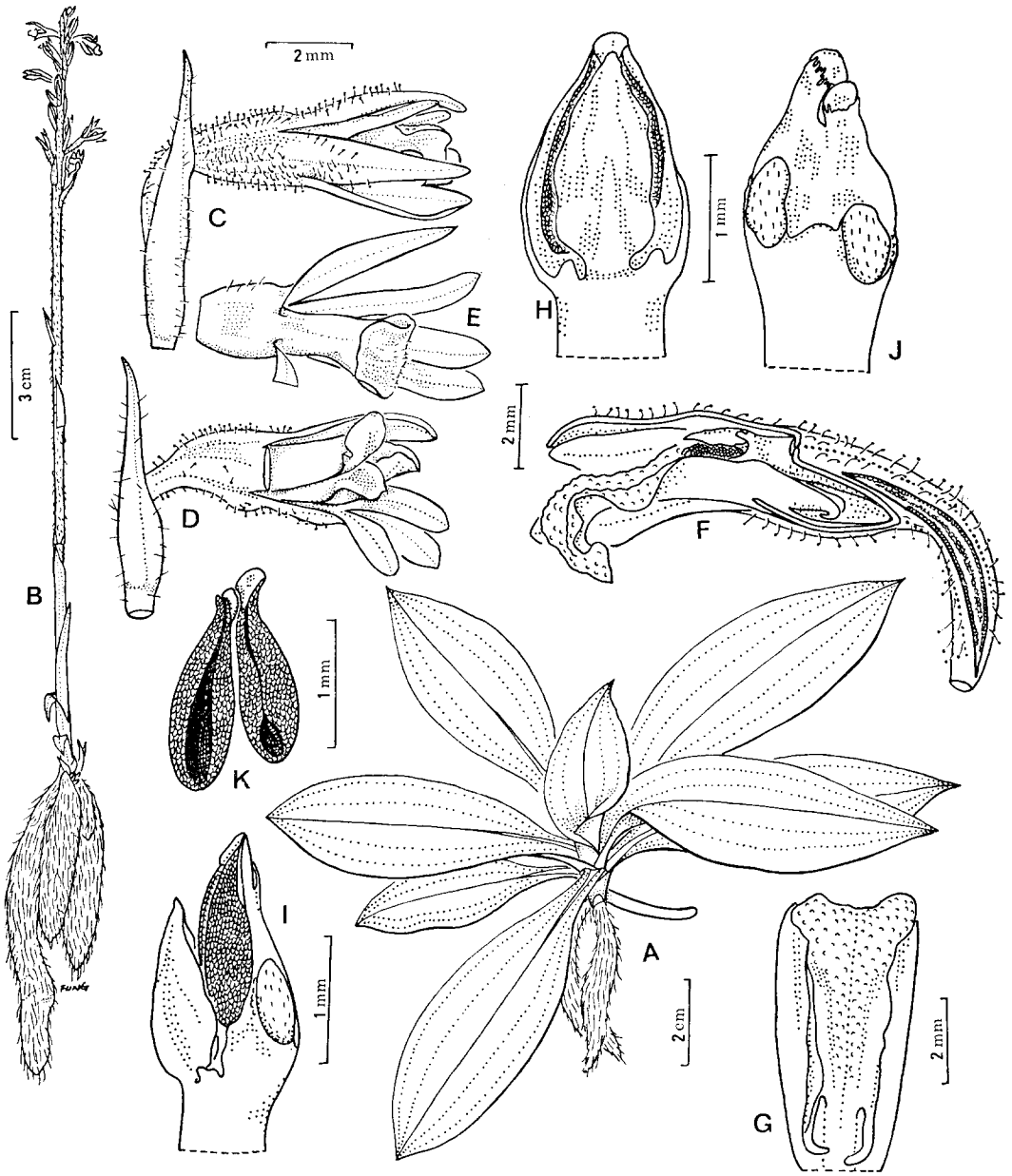

Figure 3. *Manniella hongkongensis:* A. The habit sketch of a plant with a rosette of leaves, and fusiform fleshy roots. B. The habit sketch of a flowering plant showing a scape with cataphylls, fleshy fusiform roots, and a small vegetative bud at the side of the base of the scape. C. The lateral view of a flower with a bract showing the union of the basal 2/5 of the sepals to form a swollen tube. D. The lateral view of an abnormal flower with 1 sepal removed, showing the doubled condition of the lip. E. The ventral view of a portion of a flower showing the recurved tip of the lip. F. The lateral view of a flower with a petal and a lateral sepal and portion of the odd sepal removed, showing the fleshy lip with 2 hooked appendages in the pouch formed by the union of the basal portion of the lip and the 2 lateral sepals, the column with the anther slightly tipped up showing the 2 separate pollinia, and a portion of the ovary showing the parietal placentation. G. The adaxial view of the lip showing its union with the 2 lateral sepals, the 2 basal hooked appendages and the thick papillose disc. H. The dorsal view of the column showing the 2 apical lobes (representing staminodes), the clinandrium, the anther, the pollinia, the rostellum, and a large viscidium attached to the pollinia of the right side. I. The lateral view of the column showing the anther, a staminode, 2 pollinia, a beak-like rostellum forked at the apex, and a stigma. J. The ventral view of the column showing the rostellum unequally lobed, each lobe with a viscidium, and the 2 lateral stigmas at uneven levels. K. Dorsal view of the 2 pollinia separated, folded, each with a viscidium.

curving from the base of the perianth-pouch, glandular-hairy, striate-sulcate, placentas 3, parietal.

Post-anthesis: *Leaves* 7–8, emerging as the flowers fade, convolute, all basal, forming a rosette over the soil at ground level, bluish green above, light green beneath, iridescent in the sunlight, petioles narrow, 1 cm. or less long, impressed above, elevated beneath, laminas elliptic, oblong or oblong-elliptic, 3.5–6.5 cm. long, 1.5-3.5 cm. wide, the base cuneate, the apex acute, the margin occasionally wavy, veins light green, midrib quite prominent, slightly grooved above, elevated beneath, primary lateral nerves 2 on each side running parallel from base to apex.

HONGKONG: New Territories, Shatin. *S. Y. Hu 13266* (Holotype K,) April 9, 1973, in a narrow gorge, transplanted by Gloria Barretto in June, 1965. It has flowered in her garden repeatedly.

This species is a deciduous orchid, which requires a resting period during the dry monsoon season in Hongkong. The leaves begin to turn brown and wither in November. The flowering scape emerges before the leaves at the end of January. The flowers open in early April. The life cycle of the species is affected by the climate, when there is a wet autumn, the plants may retain their leaves a couple of months longer. In such a case, the flowering and leafy shoots appear much later in the following growing season.

Manniella hongkongensis is related to *Manniella americana* Schweinford & Garay. The rosette of basal leaves, the pouch-like structure below the apex of the ovary, and the narrowed base of the lip with a pointed appendage on each side, are common characters of both species.

The genus *Manniella* seems to exhibit a very interesting phenomenon in phytogeography. The species of the genus are few and widespread in the tropics —with species in tropical Africa, America, Hongkong, and perhaps one in Java. This is not unusual. The recent discovery of *Disperis* from the Lantau Peak of the New Territories, Hongkong, indicates a similar condition of disjunction.

The description and illustrations of this species have been communicated to Professor Holttum, and to Dr. Brieger, as early as mid-1972. In addition to these outstanding orchidologists, others have expressed their opinion on its generic status, and Dr. Brieger has considered establishing a new genus to include this, and a species reported from Java by J. J. Smith.

Goodyera R. Brown

Goodyera foliosa (Lindl.) Hook. f. var. **alba** S. Y. Hu et Barretto, var. nov. (Figure 4. A-I).

A typo differt floribus albis, petalis unguiculatis, 1–1.2 cm. longis, 6 mm. latis, basi labello saccato et rotundato, rostello bifido spathulato-caudato.

HONGKONG: New Territories, Taimoshan. *G. Barretto 100* (Holotype K.) September 21, 1974, bracts pale greenish white, longer than the flower; sepals hairy, creamy white tinged green on dorsal sepal, petals glabrous, ovary deep brownish purple.

This variety was discovered by Ruy Barretto on Taimoshan in July 1970, and was transplanted to his garden where it has flowered repeatedly. It is distinguished from *G. foliosa* var. *foliosa* by the colour and the structure of its flowers. In this variety the odd sepal is white and tinged green, 9–10 mm. long, 5 mm. across the base, the lateral sepals 5 mm. long and with straight lower margin, the petals 10–12 mm. long, 6 mm. wide, the lip white, saccate with a roundish base, the column 3.5 mm. long, white and speckled reddish brown and the anther oblong-ovoid, 4–5 mm. long. In *G. foliosa* var. *foliosa* the odd sepal is brown outside, salmon-pink inside, creamy-white along the margin, the lateral sepals 5–7 mm. long, 4 mm. wide and with strongly curved margin, the petals salmon-pink with creamy-white margin, 5–7 mm. long, 4 mm. wide, the lip deep orange and white toward the apex, strongly saccate with a hemispherical base, the column yellow and 2 mm. long, and the anther ovoid and 2.5 mm. long (Fig. 4, J–L).

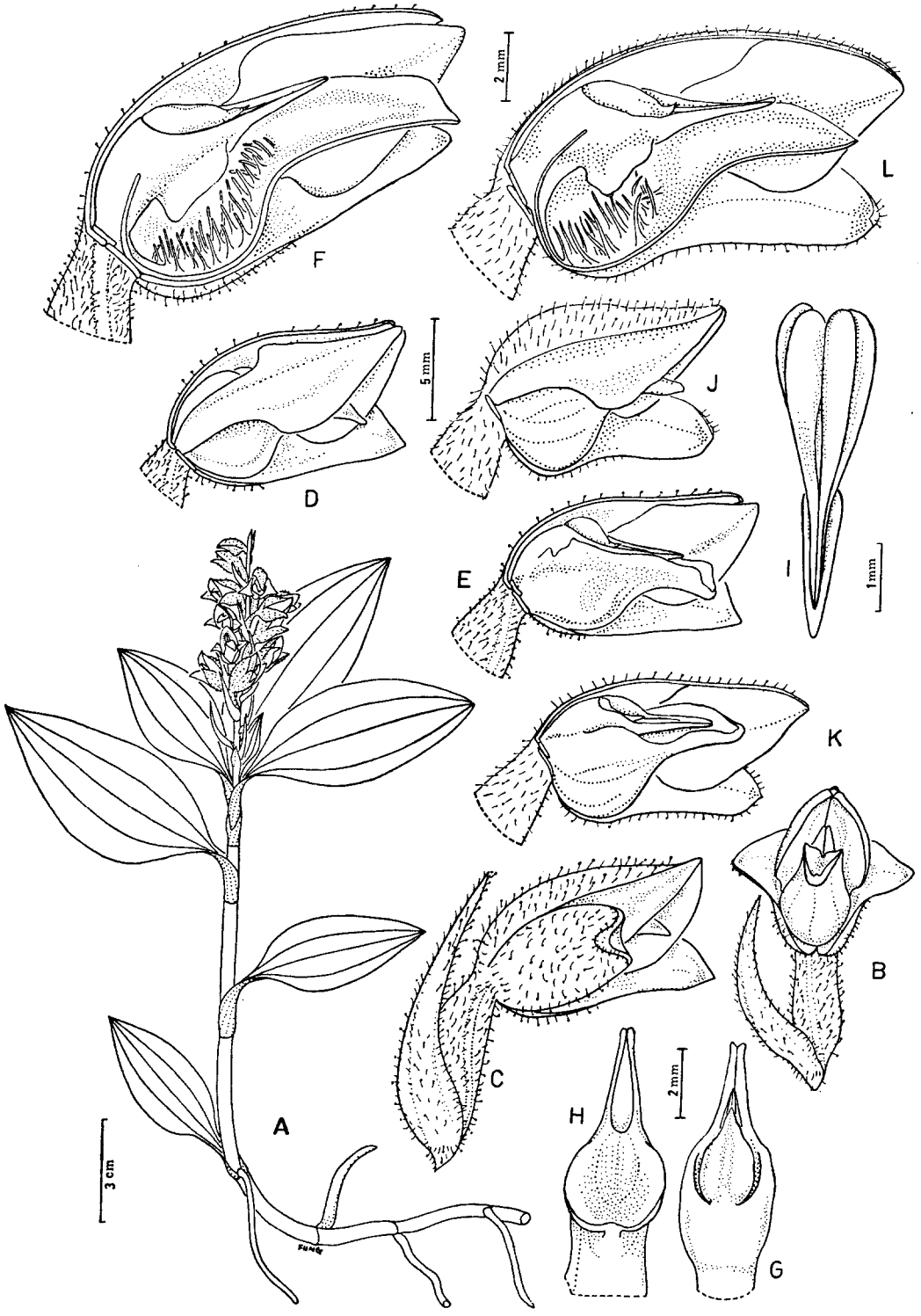

Figure 4. *Goodyera foliosa:* A-I. *Goodyera foliosa* var. *alba:* A. The habit sketch of a flowering plant showing the creeping rhizome and the ascending flowering stem with 6 cauline leaves, and a terminal spike. B. The front view of a flower showing the hood formed by the odd sepal and the petals, the lip, and the glandular-hairy ovary. C. The lateral view of a flower showing the bract, sepals, and ovary (all glandular-hairy), the petals, and the lip. D. The lateral view of a flower with half of the odd sepal and 1 lateral sepal removed, showing the unguiculate petal, and the saccate base of the lip. E. The same, with a petal removed, showing the lip and the column. F. The same with half of the lip removed, showing the papillose inner surface of the sac, and the column with the anther. G. The dorsal view of an apical portion of the column with the anther. H. The ventral view of the same, showing the long viscid disc, the bifid and caudate rostellum, and the stigma. I. Four pollina in 2 pairs attrached to the viscid disc. J-L. *Goodyera foliosa var. foliosa:* J. The lateral view of a flower with a lateral sepal removed, showing the subfalcate petal and the sac. K. The same as above with half of the odd sepal, a lateral sepal, and a petal removed, showing the sac and the arm of the rostellum. L. The same with half of the lip removed, showing the papilli on the inner surface of the sac.

Goodyera youngsayei S. Y. Hu et Barretto, sp. nov. (Figure 5).

Herba terrestris; rhizomatibus horizontalibus, 4–5 mm. diametro; foliis ovatis, 3–7.5 cm. longis, 1.7–3.6 cm. latis, basi subcordatis, apice acutis; scapis 10–12 cm. longis, lanatis; floribus 1–3, sepalis ovatis, 14–15 mm. longis, 6 mm. latis; petalis oblique oblanceolato-spathulatis, 14 mm. longis, 6 mm. latis, basi 2 mm. latis; labello ventricoso, apice recurvato; columna 3 mm. longa; anthera sagittata, 7 mm. longa; polliniis 4, obovato-lanceolatis, 4 mm. longis; viscidio lanceolato; rostello elongato, apice bifido; ovario cylindrico, 11 mm. longo, 3 mm. diametro, apice villoso.

A terrestrial orchid with creeping stem and ovate leaves. *Root* 1 on each mature node, rather fleshy, 2–3 mm. in diameter. *Stems* creeping, consisting of 3–10 joints, internodes cylindrical, 7–34 mm. long, 4–5 mm. in diameter, the leafy portion erect; cataphylls sheathing, light green with a white margin, 10–25 mm. long, turning dry and straw-coloured at anthesis. *Leaves* 1–5, petiolate, the petioles 15–30 mm. long, the lower ones the longer; laminas slightly oblique-ovate, 3–7.5 cm. long, 1.7–3.6 cm. wide, firm, rather fleshy, shiny green above, pale green beneath, obtuse or subcordate at the base, triangular-acute at the apex, midrib narrowly grooved above, slightly elevated beneath, with 1 curving nerve on each side. *Scapes* 8–12 cm. long, woolly, bearing 1–3 evenly spaced sterile bracts and 1–3 flowers, bracts membranous, pink, lanceolate-cymbiform, 2 cm. long, acuminate at the apex; flowering bracts cymbiform, 17 mm. long, glabrous, ciliate along the margin; *flowers* sessile, of a pearly lustre to pale green; *sepals* pearl-coloured, the apices pink, veins darker, the odd sepal dorsal, 15 mm. long, 6 mm. wide, arcuate and hood-like, lateral sepals ovate-lanceolate, 14 mm. long, 6 mm. wide, spreading and pointing backward, acute at the apex, with 3 distinct green stripes parallel with the nerves; *petals* oblique oblanceolate-spathulate, 14 mm. long, 6 mm. wide, 2 mm. wide at the base, pearl-coloured, slightly pink at the apices; *lip* ventricose, rounded at the base, recurved at the apex, distinctly 5-striped, the stripes parallel, olive-green, the marginal nerve branched, the disc with 8 rows of stout papillose glandular hairs between the nerves; *column* ivory-white, base pinkish, short and stout, 3 mm. long, 2.5 mm wide at the base, suddenly enlarged at the apex and produced forward into a subulate deeply cleft *rostellum* 8 mm. long; *anther* sagittate, 7 mm. long, the apical portion long acuminate and lying in between the column arms; *pollinia* 4 in 2 pairs, obovate-lanceolate, the caudicle 6 mm. long; *viscid disc* oblong-lanceolate, purplish, tinged white, 3 mm. long; *stigma* truncate, 2 mm. vertically, 5 mm. transversely; *ovary* cylindrical, 11–15 mm. long, 2–4 mm. in diameter, villose at the apex.

HONGKONG: New Territories, Shatin, *S. Y. Hu 11668* (A, K) March 8, 1973, transplanted from Fo Tan Gorge by W. G. L. Allan in 1966, flowered repeatedly in the garden of Gloria Barretto, bracts pink, flowers pale green, stem creeping, ascending, scape villose. Patsin Range, *Gloria Barretto 107* (Holotype K; Isotype A) March 12, 1975, transplanted by R. Clibborn-Dyer, January, 1975, flowered in Kadoorie Farm and Gardens, rhizome creeping, leaves shiny green, oblique-ovate, flowers green tinged pinkish, lip with olive-green stripes.

Specimens of this orchid, collected by J. L. Youngsaye in 1933, were sent to the Royal Botanic Gardens, Kew, by G. A. C. Herklots. It was tentatively named by V. S. Summerhayes as *Goodyera foliosa* (Lindl.) Benth. ex Hook. f. In 1966 another specimen, found by W. G. L. Allan from the same locality, was sent again to Kew, and Summerhayes was consulted. The conclusion was that it could be neither *G. schlechtendaliana* Reichb. f. nor *G. foliosa* because of its thick indumentum and large flowers. The suggestion was that it may be a species new to science.

Goodyera schlechtendaliana is a species not very well understood. The Japanese and Chinese specimens at Harvard University vary greatly in size and number of flowers. The plants from Japan and China have 6 to 12 flowers. According to Ohwi, *Flora of Japan (1963), G. schlechtendaliana* has stems 12–25 cm. long, leaves 2–4 cm. long, and 1–2.5 cm. wide, inflorescences bearing 6–12 rose to white flowers, and sepals 8–10 mm. long. *Goodyera youngsayeana* has stems 10–12 cm. long, leaves 3–7.5 cm. long and 1.7–3.6 cm. wide, inflorescences bearing 1–3 pale green flowers, and sepals 15 mm. long.

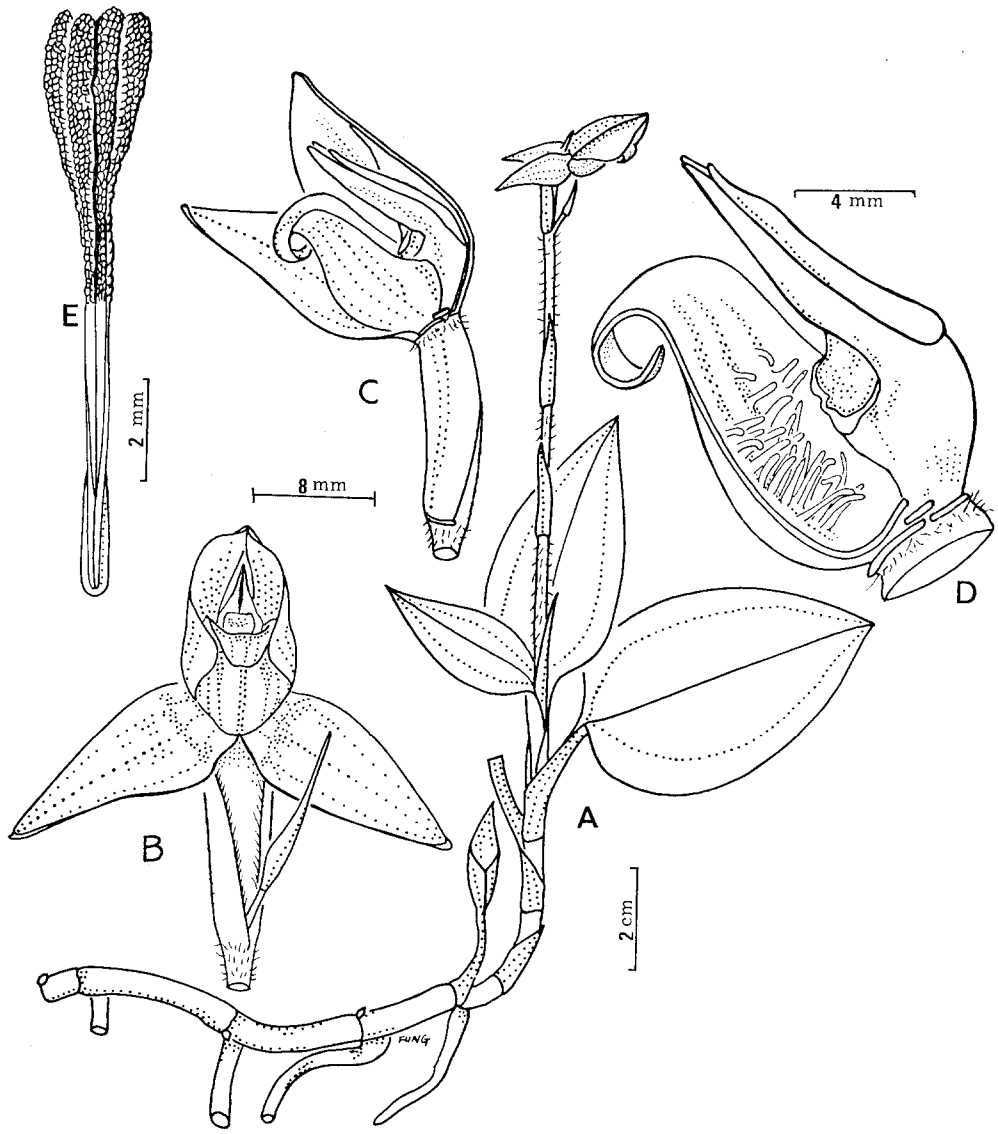

Figure 5. *Goodyera youngsayei:* A. The habit sketch of a flowering plant showing the creeping habit, the ascending leafy stem, and the very simple flowering scape. B. The front view of a flower showing the dorsal sepal and 2 petals forming a hood over the column and lip, the forked arms of the rostellum, the viscid disc, the stigma, and the widespreading lateral sepals. C. The lateral view of a flower with a portion of the dorsal sepal, a petal, and a lateral sepal removed, showing the lip recurved at the apex and saccate at the base, and the column. D. The lateral view of a flower with sepals, petals, and half of the lip removed, showing the papillose processes in the sac of the lip, the short column, the anther and the stigma. E. Four pollinia in 2 pairs, with long caudicle and viscid disc.

This species is named for J. L. Youngsaye, an ardent enthusiast who began to study the native orchids of Hongkong with G. A. C. Herklots in the 1930's.

Cheirostylis Blume

Field and laboratory studies of fresh specimens and liquid preserved material for over three consecutive years, have improved our understanding of the genus *Cheirostylis* in Hongkong. This genus is characterised by perennial and inconspicuous habit, saxicolous habitat in shade along streams, and fleshy, worm-like rhizomes with tufts of slender hair-like roots growing on the contact surface of damp mossy rocks. During the cool dry winter season, the plants normally rest in a leafless state. The flower buds emerge, before the leaves, at the beginning of the wet season in February or March. The leaves are small and with a satin-like sheen. Each mature plant bears one hairy scape with 2 to 8 inconspicuous flowers. The sepals unite into a slightly gibbous tube at the basal portion. The vegetative structures of the species are very similar and the variations in the flowers are consistent. For example, there is an obvious presence *(C. chinensis* and *C. jamesleungii)* and absence *(C. monteiroi* and *C. clibborndyeri)* of indumentum. There is also an obvious condition of bilobed large lip *(C. chinensis)* in contrast to the small simple lip *(C. clibborndyeri).*

The most striking specific characters lie in the structure of the lip and the column. For example, in *C. chinensis, C. jamesleungii* and *C. monteiroi* the lips are lobate, and with calli, while in *C. clibborndyeri* the lip is simple and without callus. The variations in the sizes and numbers of lobes of the calli are also very striking. In *C. chinesis* the calli consist of 2 rows of 5 to 6 tubercles, in *C. jamesleungii* the calli have 2 trilobed ridges (Fig. 6, C), while in *C. monteiroi* the calli are bilobed and cornute. With these morphological differences we feel that the species are well marked. As these species are poorly understood, a key and description are given to all of them, and the new species are illustrated.

Key to the Species

A. Ovary and calyx hairy; lip with 3–6 lobed calli.

B. Midlobe of lip fringed; hairs of ovary and calyx glandular; calyx shallowly cleft; calli each with 5–6 tubercles ....*C. chinensis*

BB. Midlobe of lip shallowly lobed, never fringed; hairs of ovary and calyx straight, not glandular; calyx deeply cleft; calli each with 3 lobes ....*C. jamesleungii*

AA. Ovary and calyx glabrous; lip with 2 lobed calli or without callus.

B. Lip with fringed bilobate midlobe; base of lip gibbous; lateral arms of column long and acuminate at apex ....*C. monteiroi*

BB. Lip simple and entire; base of lip flat; lateral arms of column short (Fig. 8 C).. ..... *C. clibborndyeri*

Cheirostylis chinensis Rolfe in Ann. Bot. 9: 158. 1895.

A saxicolous species growing in shade along streams. *Root* very fine, short, dense, woven with fine growth of moss tissue. *Rhizomes* horizontal, caterpillar-like, succulent, consisting of 5 irregular internodes, 4.5 cm. long, 5–12 mm. in diameter, the oldest internode the thinnest, the second behind the apex the thickest, bearing 1–3 buds on the sides, slightly narrowed at the nodes, the segments partially covered by hyaline remains of leaf sheaths; after flowering, 1 or 2 vegetative shoots emerge from the sides of the previous year's rhizome; *stems* erect, apical to the rhizome. *Leaves* 5, with membranous sheaths; laminas ovate-cordate, 2.5–4 cm. long, 2–3 cm. wide, the apex acute, the upper surface greyish green, smooth, papillose with a luminescent sheen, variegated with a lighter green band and deeper green along the more prominent veins. *Scapes* cylindrical, 15–20 cm. high, 2.5 mm. in diameter, covered by villose and glandular hairs, bearing 4 bracts, the lower 3 sheath-like; raceme 5-flowered; rachis 10 mm. long, bracts cymbiform, membranous, pink, villose, with 1 median-longitudinal

vein, pedicels 2–3 mm. long, twisted; *flowers* resupinate; *calyx* urceolate, 6–7 mm. long, the tube 4 mm. long, without distinct sepals, olivaceous, glandularly villose throughout, united at the base and divided into 3 lobes at the apex, the odd lobe dorsal; *petals* oblique-oblanceolate, obliquely truncate, 5 mm. long, 2.5 mm. wide at the apex; *lip* bilobed, attached to the sides of the column, the base gibbous, the sac with 1 row of 5–6 conic tuberculate calli on each side, the sides folded inward forming a narrow canal, the apical half suddenly enlarged into a bilobed white semi-orbicular platform, 6 mm. long, 10 mm. wide, green at the base, prominently fringed with 6 to 10 segments of uneven length about 2 mm. long along the front margin; *column* 2 mm. long, 2 mm. in diameter, dorsally membranous, fleshy below, extending forward with a ridge above and one below, and on each side into an elongated arm rounded at the tip and hollow inside, with a gland and a stigma in between; *rostellum* projected forward into 2 processes, 3 mm. long, lying in the canal formed by the column arms; *anther* dorsal, orange; *pollinia* 4 in 2 pairs, granular; *viscid disc* elliptic; *stigmas* 2, lateral, at the basal portion of each gland; *ovary* glandular-villose, 4–6 mm. long, 2–3 mm. in diameter at the apical portion.

HONGKONG: Taimoshan, New Territories, *S. Y. Hu 13143A,* (CUH, in liquid, presented by Ronald Wong, March 26, 1973), small saxicolous orchid growing on damp mossy boulders or on humus in rock pockets, at high elevations of over 600 meters, in shade of thickets by streams TAIWAN: *H. F. Hance (HK 27630).*

Dunn & Tutcher in *Flora of Kwangtung and Hongkong* (p. 267 1912), recorded *C. flabellata* Wight from Mount Parker, Hongkong Island. This species was originally described from Madras, eastern India. It has a flabellate lip longer than wide, and with one lobe. The Hongkong material resembles *C. chinensis* Rolfe, originally discovered from Taiwan, with lip wider than long, and bilobed. Both the Chinese and the Indian species have glandular hairs on the ovary and calyx. They are different in the structure of the lip.

In April, 1968, and again in 1970, the species was found on Lantau Island by Ruy Barretto. It was transplanted to his garden and flowered there. The description presented here were prepared from these flowering plants. No material was preserved.

Cheirostylis jamesleungii S. Y. Hu et Barretto, sp. nov. (Figure 6).

Herba parva perennis saxicola; rhizomatis carnosis, 4–5 mm. longis; foliis 3, cordatis, 3–8 mm. longis latisque; scapis 10 cm. longis; calycibus obliquo-tubulatis, villosis; labello bilobato, apice 3 mm. longo, 5 mm. lato, crasse dentato; polliniis 4, binatis; ovario sparse villoso.

A succulent perennial herb growing on damp boulders. *Root* hair-like, very short, woven with the tender tissue of *Riccia. Rhizomes* cylindrical, fleshy, 4–5 cm. long, 2–6 mm. in diameter, consisting of 6–7 sausages-shaped smooth bronze-green internodes. *Stems* erect, terminal to the rhizome, bearing 2–3 small leaves. *Leaves* reddish green, the sheath 2.5 mm. long, petioles red, 1 mm. long; laminas cordate, 3–8 mm. long, 3–8 mm. wide, papillose, apex acute, veins reticulate. *Scapes* slender, 10 cm. high, bearing 4 well spaced sterile bracts and flowers at the apex, sparsely villose, the hairs wavy, eglandular; flowering bracts cymbiform, pink, hyaline, with a median-longitudinal vein; *flowers* 2 or 3, subsessile, resupinate; *calyx* 4 mm. long, oblique-tubular, without distinct sepals, pink, saccate below, villose only near the base, the tube 2 mm. long, the lobes glabrous; *petals* oblique-oblanceolate; *lip* bilobed, white, 5 mm. long, the base saccate and extending downward to join the sides of the column, the sac with 2 trilobed calli, one on each side, the margin of claw folding inward forming a canal, the apical enlarged bilobed portion 3 mm. long, 5 mm. wide, each lobe with 5 to 6 coarse teeth; *column* 1 mm. long, dorsally membranous, fleshy below, extending forward into 1 long anterior arm on each side, with the gland and stigma above; *rostellum* forked; *anther* dorsal, apex obtuse; *pollinia* 4 in 2 pairs, granular; *viscid disc* in the fork of the rostellum, 1 mm. long; *stigmas* 2, lateral, at the lower portion of each gland; *ovary* sparsely villose, oblong-obovoid, 5 mm. long, 2 mm. in diameter, pink.

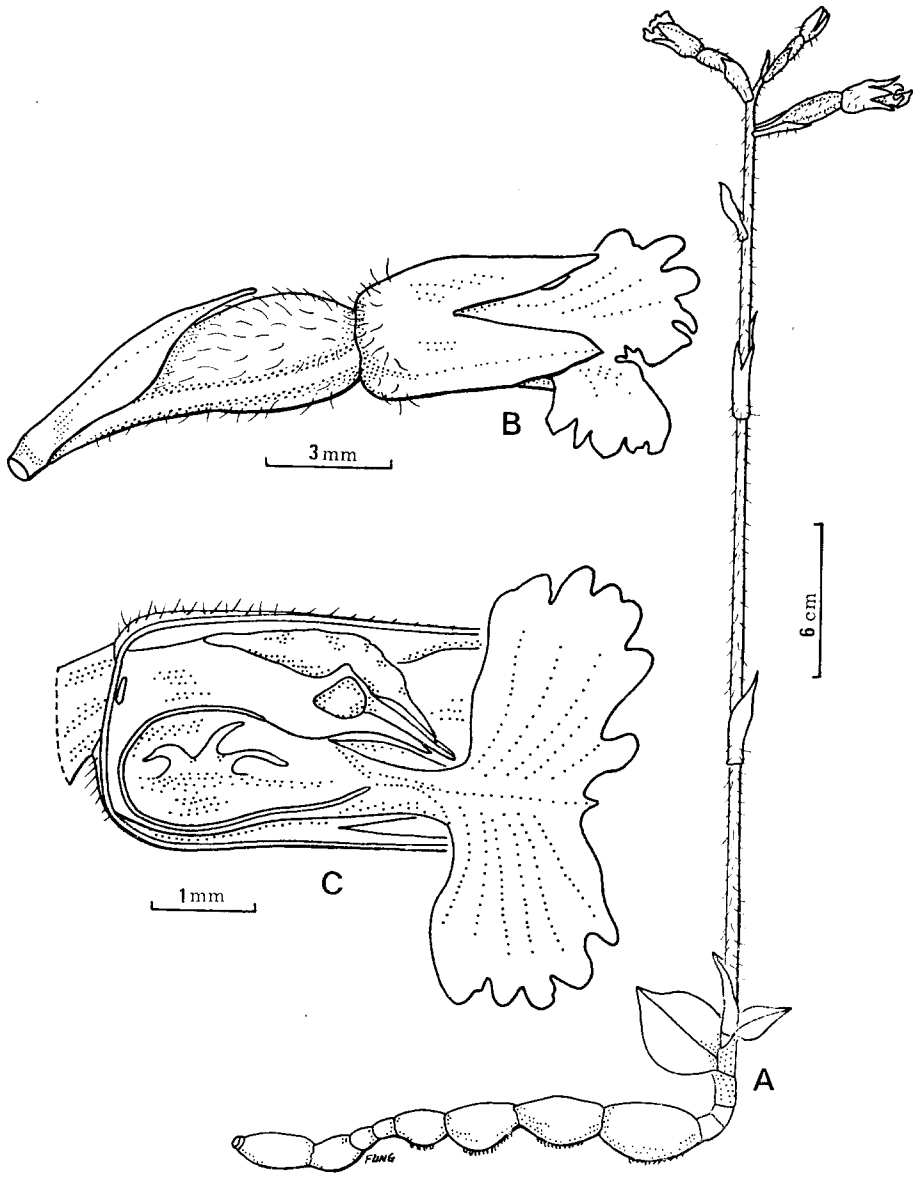

Figure 6. *Cheirostylis jamesleungii:* A. The habit sketch of a flowering plant showing the fleshy caterpillar-like rhizome with hairy structures on the surface where it contacts the rock, an ascending shoot with 2 basal leaves, and a flowering scape bearing 3 flowers. B. A flower showing the bract, the obovoid ovary, the tubular calyx, and the lip with the apical lobes irregularly lobed. The hairs on the ovary and calyx are straight and not glandular. C. The lateral view of a flower with part of the calyx, a portion of the lip, and 1 petal removed, showing the slightly saccate base of the lip attached to the side of the column, a trilobed callus, the folding margin of the side and the enlarged apical lobe. Notice the column with a lateral gland and stigma, the anther, and an arm of the rostellum.

HONGKONG: Lantau Island, *S. Y. Hu 9720A* (Holotype K; CUH in liquid), scape and ovary hairy, lip bilobed, coarsely dentate; calli tricuspidate; collected by James Leung on March 22, 1970.

This small saxicolous orchid was found growing in shade on damp humus in pockets of a mossy boulder close to a stream, at an elevation of approximately 600 meters. It is named for James Leung, who discovered and collected the plant in flower.

Cheirostylis monteiroi S. Y. Hu et Barretto, sp. nov. (Figure 7).

Herba parva saxicola; rhizomatis carnosis, olivaceis; foliis 2–3, ovatis, 12–16 mm. longis, 8–10 mm. latis; scapis 7–9 mm. longis, pilosis; calycibus tubulatis, glabris; petalis 5 mm. longis; labello albo, apice suborbiculari; anthera sagittata; polliniis 4, binatis; ovari glabro.

Perennial succulent herb, growing on wet mossy surface of boulders. *Root* hair-like, very short, growing on the side contacting the rock. *Rhizomes* fleshy, olive-green, consisting of 4–6 internodes 5–15 mm. long, narrowed at each end, swollen in the middle to 6–10 mm. in diameter. *Leaves* 2 or 3, petiolate, the petioles sheathing, purplish green, 3–4 mm. long and wide; laminas glabrous, ovate, 12–16 mm. long, 8–10 mm. wide, dark green with darker veins, midrib plane on both surfaces, base subcordate, apex acute or acuminate. *Scapes* slender, 7–9 cm. long, 2 mm. in diameter, hairy, bearing 3–7 sterile bracts at the base and 2–8 small flowers; sterile bracts 10 mm. long, the basal four-fifths sheathing, the free apical portion lanceolate; flowering bracts cymbiform, 7 mm. long, pink; *flowers* subsessile, resupinate; *calyx* glabrous, tubular, without distinct sepals, the tube 3 mm. long, the free portion 2 mm. long, slightly gibbous at the base, olive-green washed pink; *petals* white, oblique-oblanceolate, 5 mm. long, the broadest point 1.5 mm. wide; *lip* bilobed, 4.5 mm. long, adnate to the sides of the column, the base fleshy with the margin curved inwards and saccate with a bilobed and cornute callus on each side; the apical lobes suborbicular in outline, 7 mm. in diameter, green in the centre between the lobes, the remaining portion white, distinctly fringed, the strips 5–8 on each side, 2 mm. long; *column* 1 mm. long, compressed cylindrical, the dorsal portion membranous, the lower portion fleshy, extending forwards into a narrowly acuminate anterior arm 1.5 mm. long at each side, with a gland and a stigma above; *anther* yellow, sagittate, 1 mm. long; *pollinia* 4 in 2 pairs, granular, *viscid disc* linear-lanceolate, 1 mm. long; *rostellum* projecting forward and forked, with the arms 1.5 mm. long and with the viscid disc situated in between; *stigmas* 2, lateral, at the basal portion of each gland; *ovary* cylindrical, 5–6 mm. long, 1.5–2 mm. in diameter, completely glabrous.

HONGKONG: Mount Parker, *U. A On Herb. HK 7133* (HK) March 15, 1889; Mount Violet, *S. Y. Hu 11992* (A) May 17, 1972, (collected by Clibborn-Dyer.) Ovary glabrous, column with 2 front processes, rostellum forked with elongated, elliptic viscidium between the arms, stigmas 2, lateral, below the rostellum, basal portion of lip saccate with 2 bicornute white tubercles, 1 on each side; *S. Y. Hu 13056* (Holotype K; Isotyes A, CUH, HK, PE) March 6, 1973, small epiphytic orchid creeping on damp surfaces of rock, or partly buried in humus, at elevations of about 300 metres, in shade of shrubs and trees on steep hillsides, close to streams (presented by R. Clibborn-Dyer).

This orchid is named for F. M. Monteiroi who transplanted the species to Gloria Barretto's garden. That plant died. Later, Clibborn-Dyer collected the material here cited as the holotype, from the same locality. U. A On's collection in the Hongkong Herbarium was originally identified as *Cheirostylis flabellata* Wight, an epithet for a species in India, which does not occur in Hongkong. This specimen has glabrous leaves, a slightly hairy scape, and glabrous ovary and calyx. It has past the flowering period and the lips of the flowers have withered. One detached fragment shows the lip being fringed, but the segments are broken.

Cheirostylis clibborndyeri S. Y. Hu et Barretto, sp. nov. (Figure 8).

Herba parva, perennis, saxicola; rhizomatis carnosis, 4 mm. longis, olivaceis; foliis 3–4, ovatis, 1–2 cm. longis, 7–12 mm. latis; scapis 12–15 mm. longis, pilosis; calycibus tubulatis, 5 mm. longis;

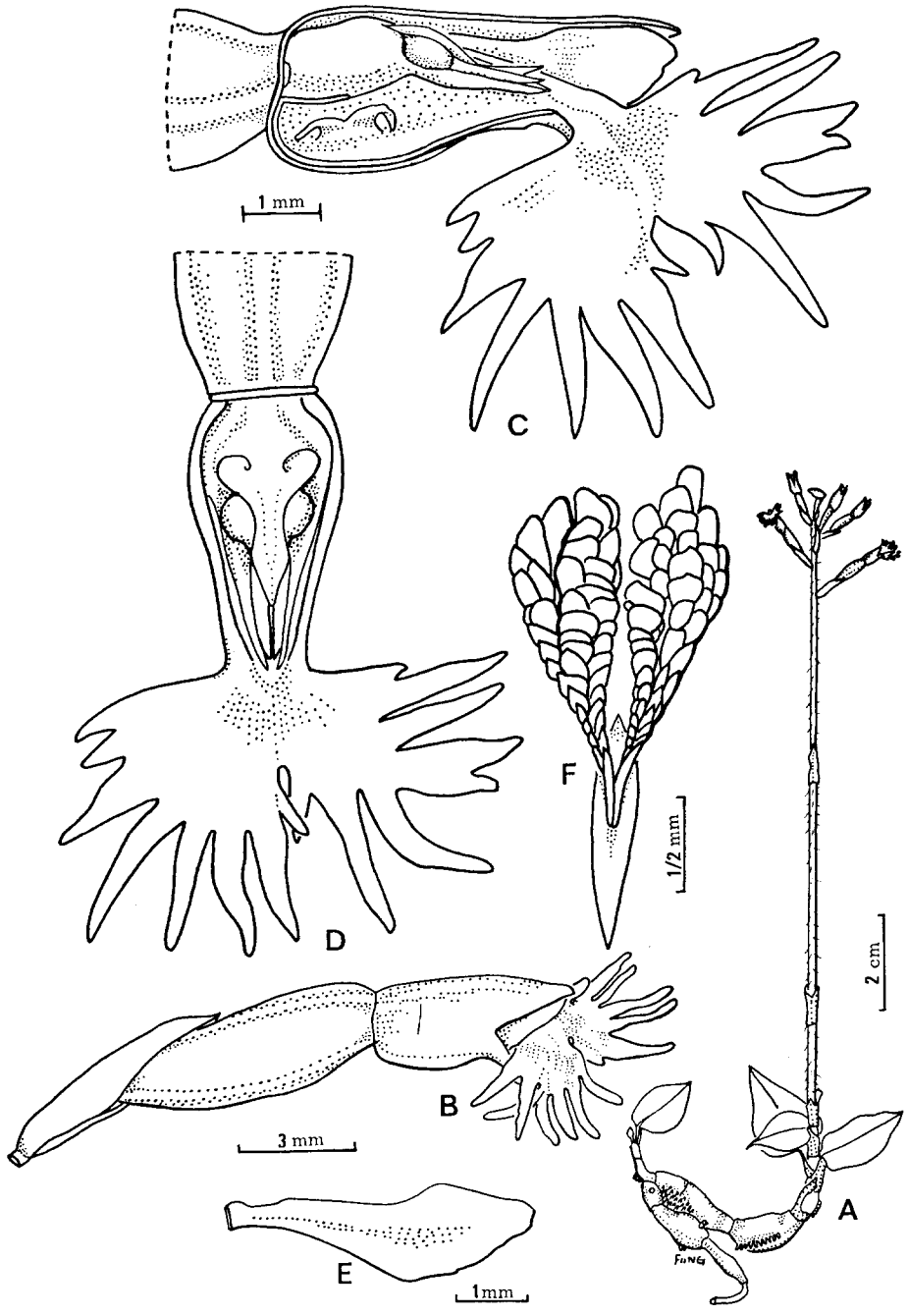

Figure 7. *Cheirostylis monteiroi:* A. The habit sketch of a flowering plant showing the fleshy rhizome, the ascending shoot with 2 to 3 basal leaves, and a flowering scape bearing 6 flowers. B. The lateral view of a flower showing the bract, the glabrous ovary and calyx, a petal, and the lip with fringed margin. C. The lateral view of a flower with portion of the calyx, the base of the lip, and 1 petal removed, showing the relative position of the column and lip, the bilobed horn-like callus on one side of the sac of the lip, the column with prolonged apical arms, the anther, the forked rostellum, and a lateral stigma. D. The dorsal view of a portion of the flower with the calyx and petals removed, showing the lip folded at the sides, the column with prolonged apical processes, the anther, the forked rostellum, and the lateral glands and stigmas. E. The lateral view of a petal. F. The pollinia, attached to a long elliptic viscid disc.

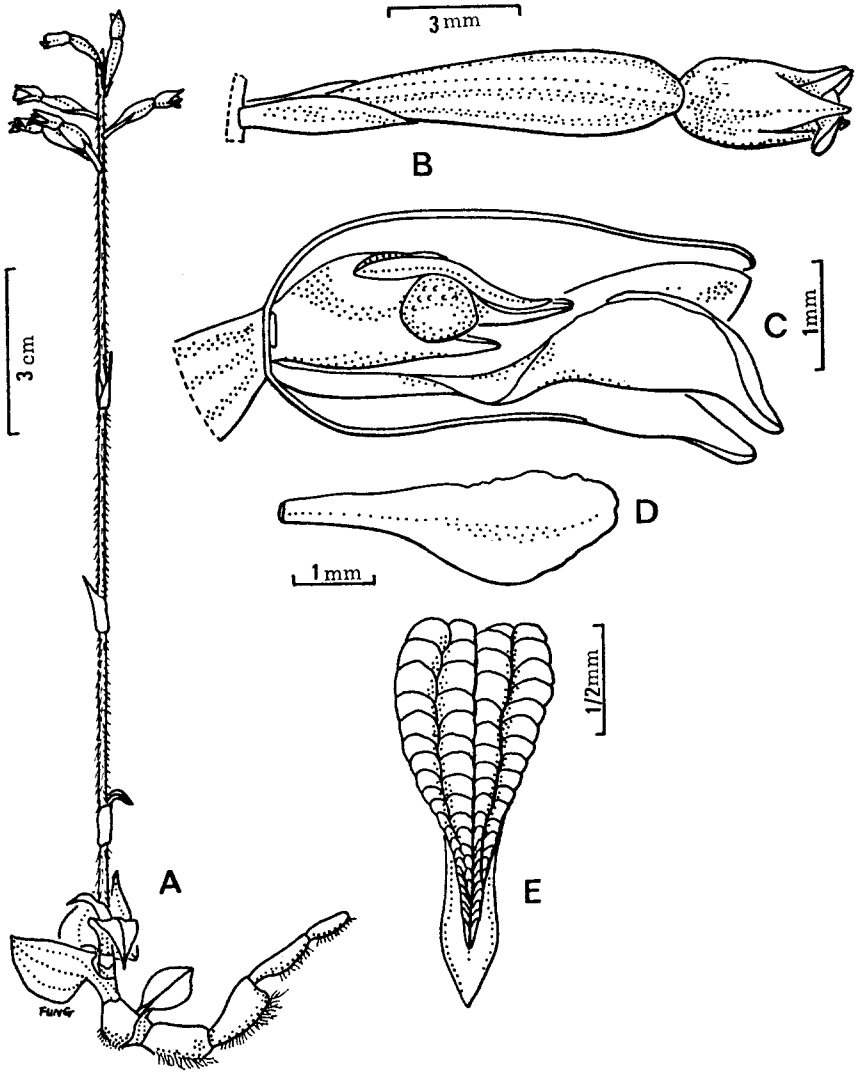

Figure 8. *Cheirostylis clibborndyeri:* A. The habit sketch of a flowering plant with a fleshy rhizome, short leafy shoot, and a flowering scape with 6 flowers. B. The lateral view of a flower showing the bract, the glabrous ovary and calyx, the petals, and the very simple tongue-like lip. C. The lateral view of a flower with portions of the ovary, calyx and 1 petal removed, showing the simple unguiculate lip plane, without sac or callus at the base, and tongue-like at the apex, the very short column with a lateral gland and stigma, a short front arm, the anther, and 2 lobes of the elongated rostellum. D. The lateral view of a petal. E. The pollinia and viscid disc.

petalis oblanceolato-spathulatis; labello integro, unguiculo, 3–5 mm. longo; columna 1 mm. longa; anthera sagittata; polliniis 4, binatis; ovario glabro, ellipsoideo, 5 mm. longo.

Perennial succulent herb growing on wet surface of boulders. *Root* hair-like, very short, 1.5 mm. long, growing in a narrow line on the side contacting the rocky surface. *Rhizomes* worm-like, 4–6 cm. long, fleshy, olive-green, simple or branched, consisting of 4–6 internodes, the joins narrowed at each end to 3 mm. in diameter, and swollen in the middle to 4–7 mm. in diameter. *Leaves* 3–4, terminal to the ascending apical end of the rhizome, crowded or well spaced; petioles obvious, the sheathing portion 2–3 mm. long, the free portion 1–3 mm. long; laminas ovate, 10–20 mm. long, 7–12 mm. wide, sage-green with satin-like sheen, variegated with a lighter green band, 1–3 mm. wide, along the midrib marked with deeper green veins, the base rounded, the apex acute. *Scapes* emerging from the apex of the last internode, 12–15 cm. long, 1.5 mm. in diameter, hairy, bearing 3–4 sterile bracts 1–4 cm. apart, 3 mm. long, 1 mm. wide, pinkish brown, glabrous, the basal two-thirds sheathing; flowering bracts pink, lanceolate, 3–6 mm. long, glabrous, acuminate; rachis hairy; pedicels obvious, 2–3 mm. long, glabrous; *flowers* 5 to 6, resupinate; *calyx* glabrous, tubular, without distinct sepals, 5 mm. long, the tube 3 mm. long, the free portion 2 mm. long, greenish, washed pink at the apex, the dorsal lobe 2 mm. long, triangular-lanceolate; *petals* white or greenish white, equal the calyx in length 5 mm. long, oblanceolate-spathulate; *lip* white, unguiculate, entire, 2–5 mm. long, flat, plane at the base, without callus, tongue-like at the apex, 2 mm. long, 1 mm. wide at the middle, the margin of the apical portion slightly curved upward and the apex slightly curved downward; *column* membranous, 1 mm. long, slightly swollen at the apical end forming a fleshy platform, extending forward into a short arm and bearing a large gland on each side, the basal portion being the stigma; *rostellum* two-armed, elongated, 1 mm. long; *anther* sagittate, orange, 1.7 mm. long, attached by a slender caudicle to the apex of the membranous delicate column; *pollinia* 4 in 2 pairs, granular, caudicle 1 mm. long, attached to a glossy viscid disc; *stigmas* 2, lateral to the column, at the lower portion of each gland; *ovary* glabrous, ellipsoid, 5 mm. long, 1 mm. in diameter. *Fruit* obovate-ellipsoid, 7 mm. long, 3 mm. in diameter, irregularly tuberculate on the ridges.

HONGKONG: Victoria Peak, *S. Y. Hu 13055* (Holotype K; Isotypes A, CUH, PE, HK) March 6, 1973, flowers greenish pink, altitude about 400 meters, in shade of a ravine facing south-southwest (collected by Clibborn-Dyer who crawled under barbed wire for it). NEW TERRITORIES, Beacon Hill. *S. Y. Hu 9900* (A, CUH) April 3, 1970, creeping on wet rock, in shade of forest ravine, lip tongue-like, not fringed; Maonshan, *S. Y. Hu 11817* (A) April 7, 1972, small perennial orchid on rock, rhizome fleshy, olive-green, calyx glabrous, lip very small, entire.

This small orchid grows on mossy damp rock, in shade of forest trees along the sides of swift flowing streams, at elevations of about 400 metres. The simple structure of the lip with no callus or front lobes is very different from all the species of *Cheirostylis* in our area. Some orchidologists may consider this structure of generic significance. However, we feel that the vegetative structure, the flowering time, the inflorescence, the tubular calyx, the column, the lateral stigmas and the rostellum are of the general pattern shared by every species of *Cheirostylis* in this area. On account of the differences in the lip, evidently we have two sections in the genus *Cheirostylis* in Hongkong.

This species is named for Ronald Clibborn-Dyer, a member of the Native Orchid Group. His collections and coloured photographs have advanced our knowledge on the distribution of Hongkong orchids.

Malaxis Solander ex Swartz

Malaxis allanii S. Y. Hu et Barretto, sp. nov. (Figure 9).

Herba perennis, terrestris; foliis radicalibus, plicato-venosis, ovato-ellipticis, 5–6 cm. longis, 2.5–3 cm. latis, acuminatis, margine undulatis; inflorescentiis terminalibus; pedicellis 5 mm. longis; sepalis imparibus et petalis linearibus, 8–10 mm. longis, 1 mm. latis; labello oblongo-

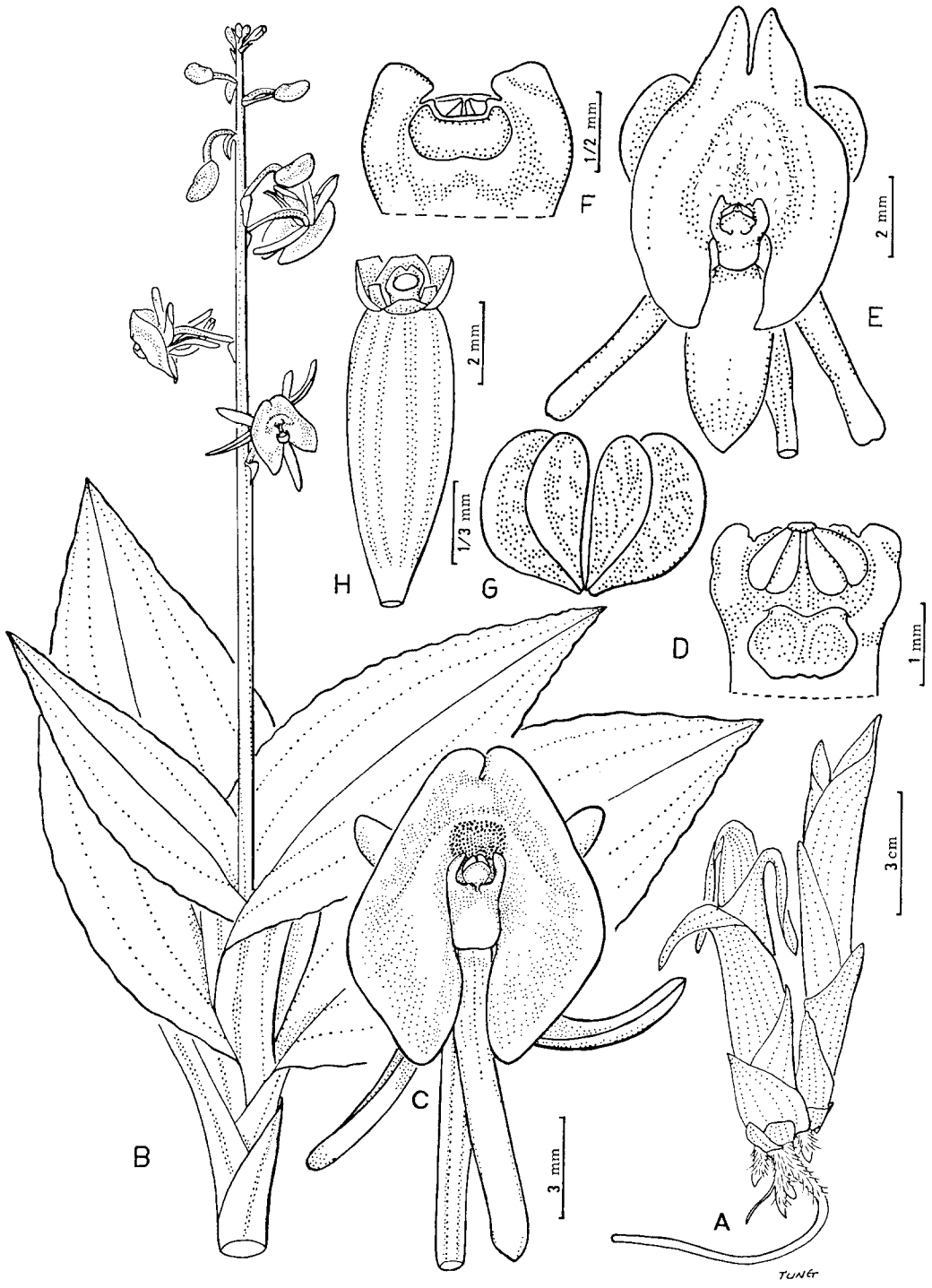

Figure 9. *Malaxis:* A-D. *Malaxis allanii:* A. The habit sketch of a pseudobulb with a young plant just prior to the emergence of the leaves. B. The habit sketch of a flowering shoot cut above the ground level, showing a cataphyll, the basal leaves with wavy margin, and a flowering scape with non-resupinate flowers. C. The front view of a flower showing the relative positions of the sepals and petals, the shield-like lip notched at the apex, auriculate at the base, and deeply concave in the middle, the column, and the anther. D. The apical portion of the column with the anther cap pushed back, showing 2 pairs of pollinia separated, the viscid disc, and the membranous rostellum. E-H. *Malaxis acuminata:* E. Front view of a flower showing the non-resupinate position with the odd sepal pointing downward, the broad lateral sepals, the narrow petals, the long shield-like lip narrowly bilobed at the apex, depressed at the middle, the anther cap and the pollinia. F. Ventral view of the column showing the stigma and the rostellum. G. Pollinia: 4 in 2 pairs. H. A fruit enlarged, showing the persistent portions of the sepals, the petals, and the lip, and the broad column with the arms close to the central axis.

orbiculari, 11 mm. longo, 8 mm. lato; columna 2 mm. longa; anthera ovoidea; polliniis 4; ovario 2 mm. longo.

Terrestrial orchid, growing in shade of ravines, at an elevation of 150 metres and above. *Root* fibrous, 1.5 mm. in diameter. *Pseudobulbs* cylindrical, 4–10 cm. long, 7–9 mm. in diameter, covered by ochraceous dried leaf sheaths; *shoots* emerging from the base of the pseudobulb, consisting of a short stem with 3 cataphylls and 4 normal leaves, terminated by a flowering scape; basal cataphylls 0.7–4.5 cm. long, light apple-green, densely marked in longitudinal rows with purple dots and streaks; leaves petiolate, petioles tinged mauve; laminas plicate at anthesis, light green, mauve along the midrib, especially beneath, ovate-elliptic, 5-9 cm. long, 2.5-4 cm. wide, wavy along the margin, acuminate and acute at the apex, midrib and lateral veins impressed above, prominent beneath. *Scapes* striate, glabrous, reddish green, usually devoid of any sterile bracts, 7–9 cm. long; rachis 4–6 cm. long, bracts triangular-lanceolate, 2–5 mm. long, recurved, with the apex touching the stem; pedicels 5 mm. long; *flowers* 3 to 8, well spaced, non-resupinate, the sepals, petals and ovary light purple; the *odd sepal* pointing downward, linear, 9–10 mm. long, 1 mm. wide, the margin recurved; *lateral sepals* pointing upward, ovate, 5–7 mm. long, 3 mm. wide, obtuse, the margin recurved; *petals* horn-like, linear, 8 mm. long, slightly curved forward; *lip* shield-like, suborbicular, 9–11 mm. long, 7–8 mm. wide, light lemon-yellow, turning to purplish red with age, the basal lobes pointing downward from the middle, the apical lobe faintly cleft at the tip and shallowly saccate at the base, with a deep trough of nectar directly in front and below the anther; *column* smooth, green, flat at the back, 2 mm. long, 1 mm. wide, with each side produced into an ear-like projection; *anther* suborbicular, wax-yellow and red at the base; *pollinia* 4 in 2 pairs, waxy; *viscid disc* cordate, glossy and transparent, joining the outer pollinia of each pair; *rostellum* truncate, membranous; *stigma* below the anther and extending into the nectar trough; *ovary* 2–3 mm. long, 1.5 mm. wide, 6 striate and sulcate, curved downward.

HONGKONG ISLAND: Repulse Bay area, *S. Y. Hu 9978A* (A, CUH) April 24, 1970, flowered in garden of Gloria Barretto, sepals and petals purplish green, lip shield-like, green, all turning reddish with age; same locality, *S. Y. Hu 13010* (A, CUH, HK, K) March 2, 1973, in a ravine, 100–150 metres elevation, endemic, not seen elsewhere; young plant with a maroon tint and veins, sepals and petals olive-green turning purplish with age, lip yellowish green, liver colour with age, pollinia 4 in 2 pairs, separated and attached to transparent viscidium; *S. Y. Hu 13551* (Holotype K; A, CUH) March 25, 1975, transplanted by W. G. L. Allan in 1969, flowered in Kadoorie Farm and Gardens, sepals and petals purplish red, lip light green turning purple with age.

Post-anthesis growth continues with increased size of pseudobullbs, with leaves growing larger, and with the wavy margin more pronounced; the spots and streaks of maroon colour are not apparent with only a mauve flush on the under surface of the leaves. The resting period of this orchid is between September and the following February.

In April, 1969, Dr. W. G. L. Allan, M. D. found a species of *Malaxis* in a gorge in the Repulse Bay area. A specimen was sent to the Herbarium, Royal Botanic Gardens, Kew, for identification. The name given was "*Malaxis* sp. near to *M. calophylla* (Reichb. f.) O. Ktze." (Sir George Taylor, in lit., January 14, 1970). According to Holttum *(Flora of Malaya 1:* 195. 1953) *Malaxis calophylla* has a flower pale pink or pink and cream, with the upper sepal 3.5 mm. long, the lateral sepals 2.5 mm. long and 1 mm. wide, and the lip 3 mm. long with 2 teeth at the pointed apex. In contrast the Hongkong material has a flower with a much larger shield-like lip, round and retuse at the apex, measuring 9–11 mm. long, 7–8 mm. wide, yellowish green turning bright maroon with age, the odd sepal 9–10 mm. long, and the lateral sepals 5–7 mm. long, 2–3 mm. wide, with the margin curved backward. These characters are sufficiently distinct to warrant a specific rank and the orchid is named for its discoverer.

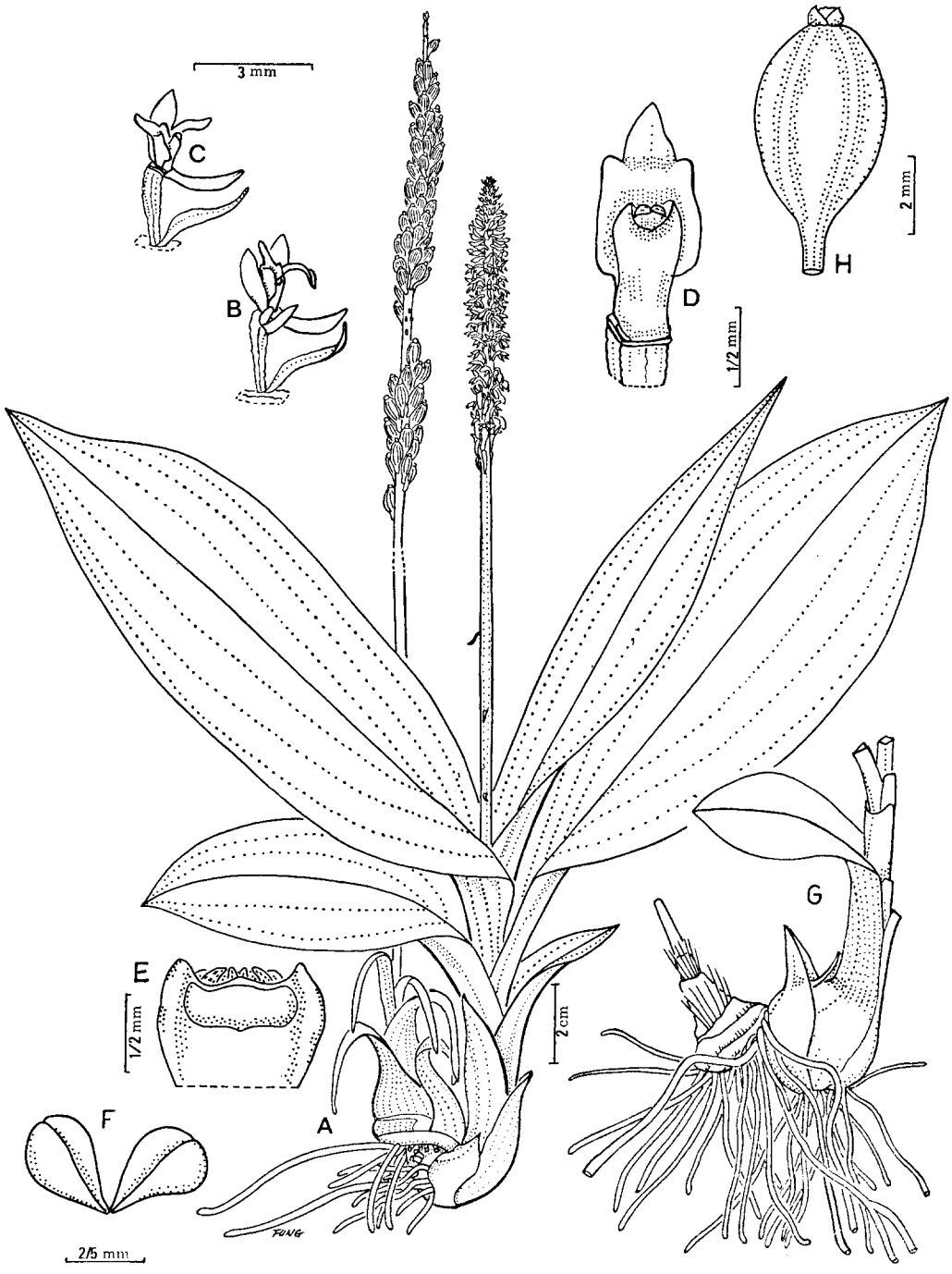

Figure 10. *Malaxis parvissima:* A. The habit sketch of a 2-year old plant with the short conic pseudobulb of the second year's growth bearing a fruit cluster, and a current year's leafy plant terminated by a flowering scape. B. The lateral view of a flower showing a long bract, sepals, petals and the lip. C. The same, with 1 sepal and 1 petal removed, showing the lip erect on both sides. D. The dorsal view of the column and lip showing the anther cap, portion of the pollinia, and the rostellum. E. The ventral view of the apical portion of the column showing parts of the pollinia, the rostellum, and the stigma. F. Four pollinia in 2 pairs. G. The short conic pseudobulbs, the one on the right indicates the shape three months after anthesis. H. The oblong-ellipsoid fruit with very short persistent column.

Malaxis parvissima S. Y. Hu et Barretto, sp. nov. (Figure 10).

Herba terrestris, 15–20 cm. alta; pseudobulbis conicis, 2.5 cm. longis, 2 cm. diametro; foliis ellipticis, 8–17 cm. longis, 2.8–5.5 cm. latis, apice acutis; floribus minutis, 2.5 mm. longis; labello carnoso, trilobato; columna 1 mm. longa; anthera ovato-cordata; polliniis 4, binatis; ovario 1 mm. longo, striato-sulcato; capsulis oblongo-ellipsoideis, 5–6 mm. longis, 4 mm. diametro.

Terrestrial orchid. *Root* fibrous, 1 mm. in diameter. *Pseudobulbs* of previous year's growth conic, 2.5 cm. long, 2 cm. in diameter at the base, contracted suddenly at the second joint, covered with the fibrous remains of dead leaves; new *shoot* originating from the base of the rhizome, consisting of cataphylls, basal leaves and a scape with numerous yellowish green flowers; cataphylls 3, sheathing, 3–7.5 cm. long, flushed mauve when young. *Leaves* tinged mauve before expansion, light green when mature, plicate, thin–chartaceous; petioles 5–6 cm. long, folded and overlapping; laminas passing from the ovate basal one to the elliptic median ones, and to the innermost lanceolate ones, 8–17 cm. long, 2.8–5.5 cm. wide, the innermost the narrowest, base cuneate, running gradually into the petiole, the apex acute or acuminate, acumen 1 cm. long, the midrib and the major 3 lateral nerves on each side indistinguishable, impressed above, elevated beneath. *Scapes* striate and ridged, 3 mm. in diameter, 17–20 cm. long, terminated by a spike 7–12 cm. long, furnished with 4 sterile bracts in the middle, 2 mm. long, traingular, acute, recurved; the rachis 6 cm. long, 3 mm. in diameter; spike crowded with nearly a hundred yellow-green flowers, flowering bracts green, lanceolate, 3–4 mm. long, 1 mm. wide at the base, the apex caudate and curved; *flowers* non-resupinate, delicately yellowish green, very small; the *odd sepal* oblong, curved, margin reflexed, pointing downward, 2.5 mm. long, 1 mm. wide, obtuse at the apex; *lateral sepals* 2.25 mm. long, 1 mm. wide, the base rounded, ovate-oblong, curving forward, the margin curved backward, apex obtuse, 3 mm. between apices; *petals* linear, 2.5 mm. long, 1 mm. wide, curved forward, apex obtuse, 3 mm. between apices; *lip* fleshy, 3-lobed, the lateral lobes expanded and wing-like, 1.5 mm. long, the midlobe ovate, 0.75 mm. long, 0.5 mm. wide; *column* cylindrical, 1 mm. long, 0.75 mm. in diameter; *anther* yellow, ovate-cordate, 0.3 mm. long, 0.5 mm. wide; *pollinia* 4 in 2 pairs, attached to the middle of the margin of the truncate *rostellum; stigma* horizontal, linear; *ovary* sulcate and ridged, 1 mm. long. *Fruit* oblong-ellipsoid, 5–6 mm. long, 4 mm. across the middle, longitudinally 6-tuberculate-ridged, with very shallow valleys in between, the base abruptly contracted to a short petiole, the apex truncate, the perianth persistent, the withered column 0.7 mm. long.

HONGKONG: New Territorities, Taimoshan, *S. Y. Hu 12453* (Holotype K, 1 leaf, 1 scape with flower and fruit; A, fragment; CUH fragments) November 8, 1972, fruit oblong-ellipsoid, 5–6 mm. long, pseudobulb conic, short; June, 1974, flowers very small, greenish yellow, many, crowded.

This terrestrial orchid is found on open mountainside. It grows among grasses at an elevation of over 900 metres, and requires a resting period during the cool dry season. It was first collected and transplanted by W. G. L. Allan, and has flowered repeatedly. According to his direction, James Leung found another plant which was transplanted to the Barretto garden and also flowered repeatedly. The description above is based on this plant.

Liparis L. C. Richard

Liparis ruybarrettoi S. Y. Hu et Barretto, sp. nov. (Figure 11).

Herba epiphytica; pseudobulbis compresso-ovoideis, 1–2.5 cm. longis, 7–15 mm. diametro; foliis linearo-lanceolatis, 11–17 cm. longis, 1.4–2.5 cm. latis; inflorescentiis racemosis, 7–14 cm. longis; bracteis lanceolato-subulatis, 3–11 mm. longis; pedicellis 6–10 mm. longis; floribus viridibus; bracteis 8–10 mm. longis; labello truncato et denticulato, callis prominentibus, viridibus, tuberculatis; anthera ovato-lanceolata, apice acuminata, pollinia 4; ovario striato-sulcato.

Epiphytic orchid. *Root* 1–2 mm. thick, emerging from the base of a pseudobulb, the new ones white, hairy. *Pseudobulbs* compressed-ovoid, 1–2.5 cm. long, 7–15 mm. across the broader portion,

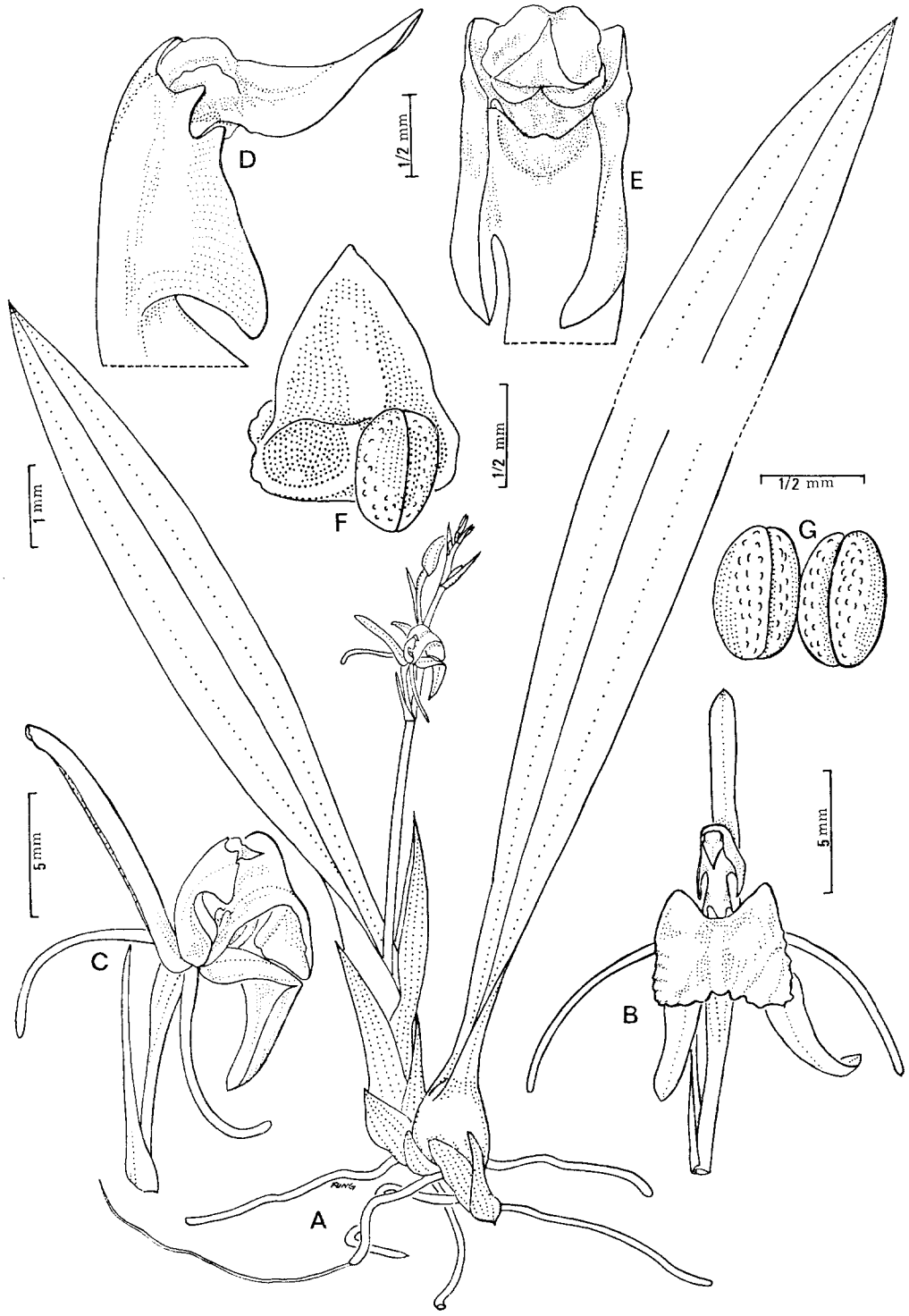

Figure 11. *Liparis ruybarrettoi*: A. The habit sketch of a flowering plant showing two-year's growth, with the cataphylls, the solitary leaf, and the scape on current year's growth. B. The front view of a flower showing the sepals, petals, the prolonged anther cap pointed at the apex, the prominent tuberculate calli, and the lip with denticulate margin. C. The lateral view of a flower showing the recurved dorsal sepal, the arcuate column winged at the apical portion, the anther, and the calli. D. The apical portion of the column showing the prolonged anther cap and the dentate apex of the column. E. The front view of the winged column with the apical portion of the anther cap turned upward, showing the pollinia, the rostellum, and the stigma. F. The anther with 1 pair of pollinia removed. G. Four pollinia in 2 pairs.

5–10 mm. across the narrower section, the oldest the smallest, 5–6 close together forming an irregular curved line, with each succeeding pseudobulb emerging from the base of the previous one, current and second years' pseudobulbs bearing leaves; the third and fourth years' growth green, fleshy, devoid of leaves; the fifth year's pseudobulbs yellowish, wrinkled or partially black and disintegrated; cataphylls 4, green, basal on current year's pseudobulbs at anthesis, the lower ones cymbiform, 6–15 mm. long, the upper ones sheathing, ensiform, folded, 2.5–4.5 cm. long, 6–10 mm. wide at the middle, acuminate, acute at the apex, evidently degenerating as the leaves attain maturity. *Leaves* solitary, 1 to each pseudobulb, not distinctively jointed with the sheath, linear-lanceolate, 11–17 cm. long, 14–25 mm. wide, the basal half slightly plicate at anthesis, becoming plane and slightly folded near the base, apex acuminate and acute, midrib impressed above, elevated beneath, the 1 or 2 lateral parallel nerves on each side rather obscure. *Inflorescences* racemose, terminating the pseudobulb, 7–14 cm. long; *scapes* distinctly compressed and slightely winged, 4.5–9.5 cm. long 1–2 mm. wide including the wings; bracts green, lanceolate-subulate, 3–11 mm. long, the lower ones the longest, progressively shorter upward, persistent; pedicels 6–10 mm. long at anthesis; *flowers* non-resupinate, in various shades of green; *sepals* green, the odd one linear, farthest away from the rachis, rather straight, 7 mm. long, 1 mm. wide, the margin strongly rolled back, the apex slightly curved outward; the lateral sepals ovate-lanceolate, oriented below the lip and strongly curved outward with an 80° to 90° angle, about 6 mm. long, 1.5–2 mm. wide at the middle; *petals* filiform, yellowish green, 7 mm. long, 0.25 mm. wide, slightly curved forward; *lip* olive-green, tongue-like, curved at a 90° angle downward, margin wavy and irregularly denticulate, the apical end truncate with a small obtuse middle projection, the base furnished with 2 prominent shiny dark green glandular calli; *column* light yellow tinged green, curved forward, resembling a bent old man wearing a flat cap, 4 mm. long, the base slightly enlarged, each side of the upper one-third furnished with a subtriangular, almost transparent wing; *anther* cap-like, ovate-lanceolate, acute, long-produced at the apex, 1.25 mm. long, 1 mm. wide at the base; *pollinia* 4 in 2 pairs; *rostellum* eave-like; *stigma* triangular-discoid; *ovary* subtriangular-cylindric, 3 mm. long, 1 mm. across, striate-sulcate.

HONGKONG: New Territories, Taimoshan, at an elevation of 700 metres, *S. Y. Hu 11444A* (A, CUH) January 21, 1972, transplanted by Ruy Barretto in January, 1969; flowered in his garden repeatedly, flowers green, calli bluish green; *S. Y. Hu 12569* (Holotype K; Isotypes A, CUH, US) December 6, 1972, attached to cliff, shady side of stream, oppsite to *Camellia granthamiana; S. Y. Hu 12570* (A, CUH, K, US) December 6, 1972, in same locality as *12569,* flowers green, turning creamy yellow, anther cap ovate.

This species is closely related to the epiphytic orchid, *Liparis plicata,* which was originally described from Japan. According to Ohwi's *Flora of Japan* (1965 ed.) the Japanese species has short bracts 3–5 mm. long, dorsal sepal 6–7 mm. long, and lip rounded, truncate, smooth at the apex, with 2 indistinct calli at the base. In comparison, *L. ruybarrettoi* has bracts 8–10 mm. long, the dorsal sepal 10 mm. long or longer, the tongue-like lip truncate, wavy and denticulate at the apex, and the anther cap ovate-lanceolate, long-produced at the apex. These characteristics distinguish this species from the Japanese one and also from the *Liparis plicata* in Hongkong. For four years we have observed and checked these characters with fresh material from different collections, and found them constant. The species has been compared with various known *Liparis* in Hong Kong. On February 23, 1973, we wrote to Professor Holttum, enclosing analytical drawings of the plant and asked him to check for *L. kwangtungensis* Schltr., which was described from Lohfoushan, about 100 miles away from the locality where our material was collected. His reply of March 3, 1973, stated. "I have looked up the description of *L. kwangtungensis* Schlechter, and find that it is certainly different, having sepals 4 mm. long, a labellum 4 mm. long, 2 mm. wide at the apex, with a quadrate callus at the base. I also found *L. uchiyamae* Schltr. from the Ryukyu Is., which is nearer to yours, but it has sepals 7 mm. long, apex of labellum

rounded and paucidentate; it has a bilobed basal callus. *Liparis taiwaniana* Hayata has flowers of about the same size as yours, but the pseudobulbs are 2-leaved, and the anther cap is very different. Hayata published an illustration (Ic. Pl. Formos. 4, pl. 7.) Schlechter did not publish illustrations of either species above mentioned." We have also received a letter from Peter Taylor, with xeroxed copies of Schlechter's original description of *L. kwangtungensis.* After comparing the description of the different organs, it appears definitely that the Hongkong plant is an undescribed species, and it is named for Ruy Barretto.

More extensive surveys indicate that specimens of related species found in Hongkong have smaller flowers, with anther caps notched at the apex. The bracts, sepals and calli of these plants approach those described from Japan. It is assumed that these specimens represent *Liparis plicata.* Although *L. plicata* is found on Taimoshan, there is little chance for cross-pollination with *L. ruybarrettoi* because of the time difference in flowering. The former flowers from September to November, and the latter from December to February.

Phaius Loureiro

Phaius tankervilliae (Banks ex l'Herit.) Bl. f. **veronicae** S. Y. Hu et Barretto, var. nov.

A typo differt sepalis petalisque citrinis, anthera dense pilosa.

HONGKONG ISLAND, Mount Parker, *S. Y. Hu 13145* (A, HK) March 26, 1973 and coloured photograph, flowers with lemon-yellow sepals and petals; *S. Y. Hu 11763* (A, CUH) April 3, 1973, sepals and petals lemon-yellow; *S. Y. Hu 13145A* (Holotype K; CUH) March 29, 1975, new growth from same plant as *13145,* lip embracing column.

This coloured form was discovered in flower, and transplanted to his home by Ronald Clibborn-Dyer in April, 1971. It flowered repeatedly in cultivation, and was exhibited in the Hongkong Flower Show in March, 1972. It differs from *P. tankervilliae f. tankervilliae* by the lemon-yellow sepals and petals, the lip being more tubular with a smaller ruffled yellow apical portion, and the anther being densely pilose on the sides. This form is named for Mrs. Veronica Clibborn-Dyer.

Ania Lindley

Ania ruybarrettoi S. Y. Hu et Barretto, sp. nov. (Figure 12).

Herba perennis; pseudobulbis ovoideis, 2.5–5.5 cm. longis, 2.5–4 cm. diametro; foliis solitariis, lanceolatis, 30–45 cm. longis, 4.5–5.3 cm. latis; scapis 40–45 cm. longis; racemis elongatis, 5–28 floribus; pedicellis 4–5 mm. longis; sepalis linearo-lanceolatis, 3.5 cm. longis, 5 mm. latis; labello 3–lobo, lobis lateralibus ovatis, 4–5 mm. longis, 3 mm. latis, intermedio semi-orbiculato, 7 mm. diametro, disco longitudinaliter 5-lamellato, calcari obtuso, 3–5 mm. longo, rotundato.

Terrestrial orchid growing in partially shaded loci in ravines or close to stream courses, at elevations of 600 metres and over. *Roots* few, 2–4 mm. in diameter. *Rhizomes* horizontal, 6 mm. in diameter, the terminal internode enlarging into a pseudobulb. *Pseudobulbs* crowded together, or very closely spaced, ovoid and smooth when young, grooved and wrinkled when old, 2.5–5.5 cm. long, 2.5–4 cm. across the base, dull green or purple in colour, at anthesis bearing 2 cataphylls and a terminal leaf; the cataphylls basal to the pseudobulb, straw-coloured, 13–21 cm. long, covering the petiole of the single leaf; petioles 15–25 cm. long, oriented at the apex of the pseudobulb. *Leaves* solitary, dark green, slightly grooved at the apical end, laminas lanceolate, 30–45 cm. long, 4.5–5.3 cm. wide, conspicuously nerved with 9 longitudinal nerves prominently elevated beneath. *Scapes* erect, emerging from the base of a mature pseudobulb, 30–45 cm. long, bearing 3 reddish, sheath-like sterile bracts; rachis 10–30 cm. long, glaucous; flowering bracts dull purple, linear-lanceolate, 8–13 mm. long, shorter than the pedicel-ovary together; pedicels 4–5 mm. long, twisted, smooth; *flowers* 5–28, well spaced; *sepals* and *petals* similar in size and colour, palmately arranged in one plane, 2.7–3.5 cm. long, 4–5 mm. wide in the middle, purplish yellow with 3–5 purple longitudinal veins running from base to apex, margin yellow, the *odd sepal* dorsal, linear-lanceolate, the lateral ones slightly

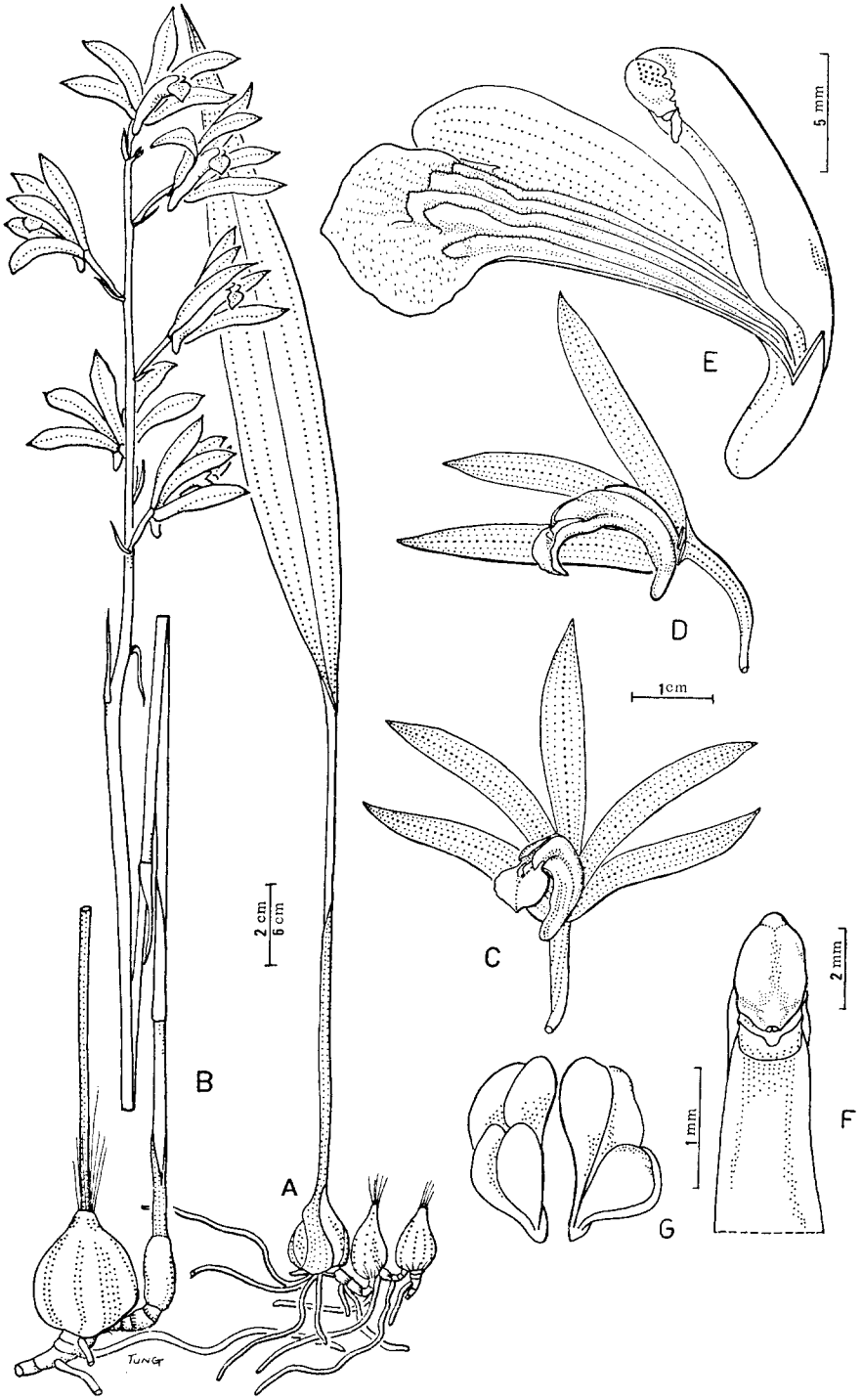

Figure 12. *Ania ruybarrettoi:* A. The habit sketch of a mature plant showing the solitary leaf with long petiole, and pseudobulbs of 3 consecutive years. B. A flowering shoot developed from the base of a pseudobulb. C. The front view of a flower showing the palmate arrangement of the sepals and petals, and the lip with the lateral lobes covering the column. D. The lateral view of a flower with 1 sepal and 1 petal removed, showing the long lateral lobe of the lip and its relationship with the column. E. The lateral view of a flower with all sepals, petals, and a side lobe of the lip removed, showing the lamellate lip. F. The front view of the apical portion of the column showing the anther, the rostellum, and the stigma. G. Eight pollinia in 4 pairs, with the smaller pairs obovoid.

falcate, *petals* oblique-oblanceolate; *lip* 3-lobed, spurred, bent, crescent-shaped, 2.2 cm. long, the sides erect, covering almost the entire column, extending forward into a distinct rounded lobe at the apex, 4–5 mm. long, 3 mm. wide, streaked and dotted bright purple, the inner surface marked with lines of bright purple hairs, the midlobe ovate, slightly curved downward, 7 mm. long and wide, the margin wavy, the apex acute, pale lavender flushed yellow, darker purple beneath, disc longitudinally 5-ridged, becoming 5-crested at the throat; *spur* orange-yellow, 3–5 mm. long, 2 mm. wide, rounded and smooth at the apex; *column* white, the front streaked purple, truncate, narrow, slightly arcuate, 12 mm. long, 3 mm. wide, sharply pointed at the apex with one to a few bright purple dots clustered on each side; *anther* hanging, ovoid, creamy yellow, and dark purple around the point of attachment, the base slightly pointing forward; *pollinia* 8 in 4 pairs, the smaller pairs oblique-obovoid; *rostellum* well exposed, triangular and projected forward into a rounded lobe; *stigma* triangular-cordate, pointed at the lower centre; *ovary* 1.4 cm. long, 2 mm. in diameter. *Capsules* cylindric, hanging, 2 cm. long, 5 mm. in diameter, with persistent perianth segments.

HONGKONG, New Territories, Shataukok, the north flank of the Patsin Range, *S. Y. Hu 11671* (A) March 26, 1972, transplanted and flowered repeatedly in Barretto's garden, sepals and petals lemon-yellow beneath, brownish purple above; lip white, streaked and dotted with bright purple hairs, margin ivory with 2 shallow notches on the side; *S. Y. Hu 11671B* (A) March 6, 1973, specimen from new growth of collection *11671; S. Y. Hu 13098* (A, CUH) March 10, 1973, sepals and petals dull red and yellow well mixed, lip white, maculated purple on the lateral and midlobes, column covered by lip, anther cap dark violet; *S. Y. Hu 13098A* (Holotype K; Isotype PE) March 14, 1975, from new growth of same plant as 13098.

This orchid is named for Ruy Barretto who discovered and transplanted it in April, 1968. In 1969 it flowered in his garden and a specimen was sent to Kew for identification. The reply stated that it was *Tainia virdifusca* (Hook.) Bentham. After reviewing the literature on *T. viridifusca* and from a careful study of living and preserved material of our species we feel that they are related but not identical. *Ania ruybarrettoi* is closely related both to *Ania hongkongensis* (Rolfe) Tang & Wang, and *A. viridifusca* (Hook.) Tang & Wang. It differs from the first species in that its flowers are much larger, with the lip 3-lobed, and with the apices of the lateral lobes distinctly ovate, 4–5 mm. long, the column 12–13 mm. long, the petals 2.7–3.5 cm. long, the spur not bilobed, and the restellum projected forward into a rounded lobe. In *A. hongkongensis* the flowers are smaller, the lip simple with erect lateral lobes but not projecting forward, the column 7–8 mm. long, the petals 1.8–2.2 cm. long, the spur bilobed, and the rostellum eave-like. Our species resembles *Ania viridifusca* in the ovate lateral lobes of the lip but it differs from that species in having symmetrical pseudobulbs, purplish yellow flowers, rounded midlobe of lip, the spur not bilobed, and in the much projected round lobe of the rostellum. In *A. viridifusca* the pseudobulb is oblique, the flowers greenish brown, the midlobe of lip cordate, and the rostellum eave-like as illustrated by Hooker (Curtis Bot. Mag. 78: t. 4669. 1852, then named *Calanthe viridifusca* W. J. Hooker). *Ania ruybarrettoi* has also been checked with *Ania hookeriana* (King & Pantling) Tang & Wang ex Summerhayes (Bot. Mag: t. 1553. 1935.) and they are not identical.

Botanists differ in their interpretation of the generic limits of *Tainia*. Holttum in *Orchids of Malaya,* places species of *Mischobulbum* and *Ania* all in *Tainia*. Tang and Wang recognised them all as distinct genera.

In the *Check List of Hongkong Plants* (1967) there is mention only of *Tainia hongkongensis*. Since then, field studies by the Hongkong Wild Orchid Group and research in the laboratory have increased the species to four. It seems advisable to follow Tang & Wang in the assignment of the species to different genera. Consequently there are *Mischobulbum cordifolium* (HK.) Schltr., *Tainia dunnii* Rolfe, *Ania hongkongensis* (Rolfe) Tang & Wang, and the above new species, *Ania ruybarrettoi.*

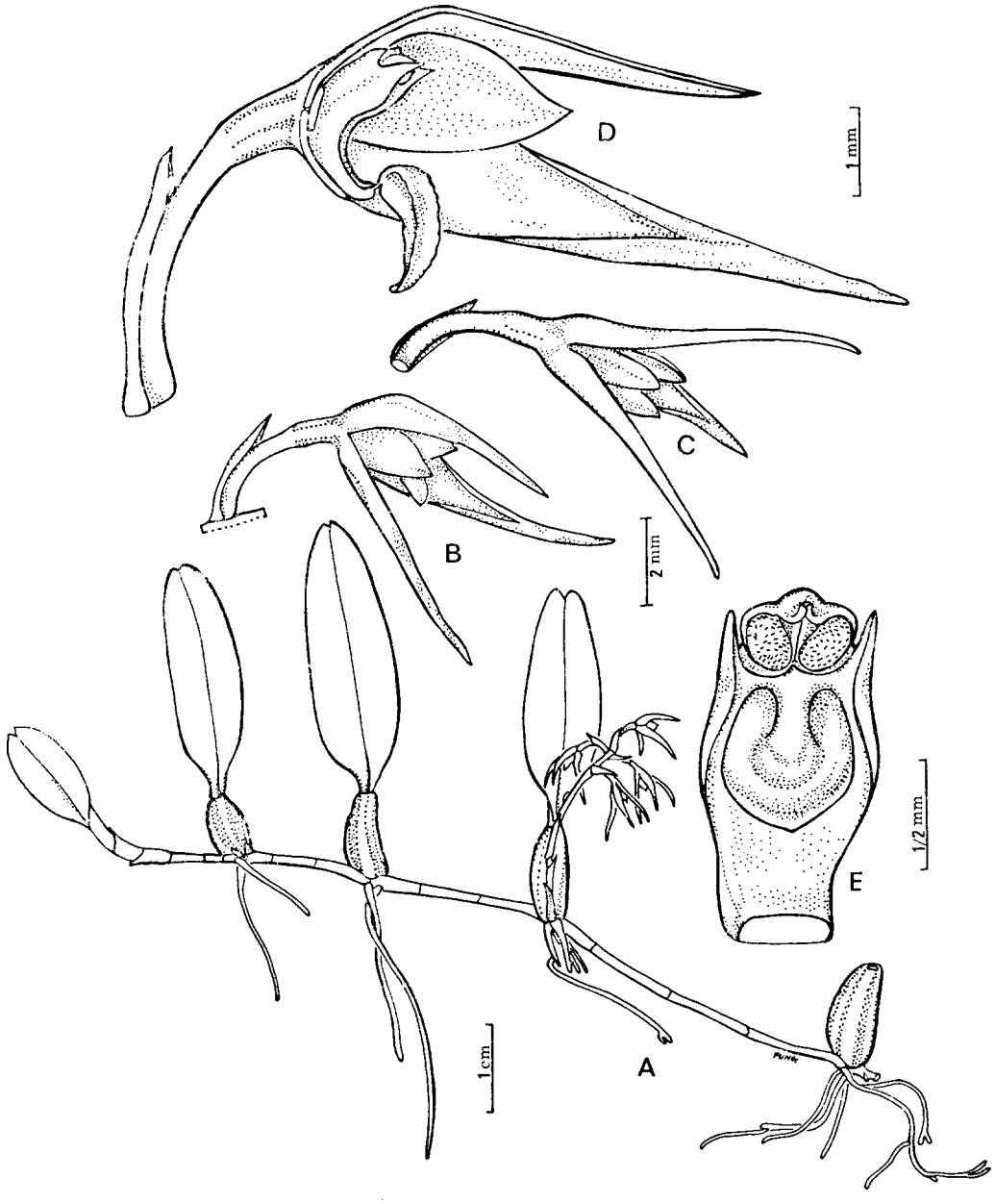

Figure 13. *Bulbophyllum youngsayeanum*: A. The habit sketch of a flowering plant showing the pseudobulbs of 4-years' growth, the orientation of a flowering scape, and a young shoot with the pseudobulb not yet formed. B. The lateral view of a flower showing the lanceolate sepals, the ovate petals, the lip, the ovary, and the pedicel. C. The ventral view of a flower showing the dorsal and 2 lateral sepals, the petals, and the lip. D. The lateral view of a flower with half of the dorsal sepal, a lateral sepal, and a petal removed, showing 1 petal, the column with a long curved foot, the mentum and the tongue-like movable lip. E. The apical portion of the column with anther cap slightly tipped up showing the pollinia, the rostellum, the arm-like processes and the stigma.

These genera are distinguished by the following characters. In *Mischobulbum* the leaves are cordate, the pseudobulbs petiole-like, and the flowers with a very long mentum. In *Tainia* the leaves are linear-lanceolate, the pseudobulbs cylindric, and the flowers with a very short mentum and no spur. In *Ania* the leaves are linear-lanceolate, the pseudobulbs ovoid, and the flowers with a short spur and no mentum.

Bulbophyllum Thours

Bulbophyllum youngsayeanum S. Y. Hu et Barretto, sp. (Figure 13).

Herba saxicola; rhizomatis gracilibus; pseudobulbis ovoideis vel oblongo-ovoideis, 3–15 mm. longis; foliis solitariis, oblongis, 1.2–3 cm. longis, 5–11 mm. latis, apice rotundatis et retusis; inflorescentiis subumbelliformibus, floribus citrinis et aurantiacis; sepalis 3.5–5 mm. longis; petalis 2 mm. longis; labello carnoso, 1 mm. longo; anthera subglobosa; ovario 1 mm. longo, striato-sulcato.

A small saxicolous orchid. *Root* thread-like, 2 or 3 emerging at a node below the pseudobulb, 15–40 mm. long, 0.75 mm. in diameter, greyish green. *Rhizomes* slender, wire-like, 1–1.5 mm. in diameter, the sections of about 10–30 mm. between pseudobulbs, containing 2–3 nodes marked by sheathing scales; shiny green when young, the scales 2–3 mm. long, disintegrating after a year. New shoots emerging from the base of the pseudobulbs, terminated with a single leaf and later developing into a pseudobulb below the leaf (Fig. 13, A). *Pseudobulbs* variable in size and shape from ovoid to oblong-ovoid, rarely subglobose, 3–15 mm. high, 3–5.5 mm. across, striate when young, ridged and sulcate when old. *Leaves* solitary, tough, coriaceous, each terminal to a pseudobulb, lasting up to 2 or 3 rarely 4 years, young ones conduplicate in bud; laminas oblong or ovate-oblong, 12–30 mm. long, 5–11 mm. wide, slightly recurved, deeply grooved, the apex unequally rounded and retuse, the midrib strongly impressed above, rather inconspicuous beneath. *Scapes* 15–20 mm. long, emerging from one side of the base of the pseudobulb, very slender, green, bearing 2–3 reddish green acute scales at the basal portion, terminating with 3–4 subumbelliform flowers; flowering bracts lanceolate, 2–3 mm. long, membranous, colourless; pedicels 1.5–2 mm. long, smooth; *flowers* creamy yellow and deep orange; *sepals* all about the same in colour and shape, lanceolate, fleshy, pale yellow at the basal half, deep orange at the apical half; *odd sepal* dorsal, slightly pointing downward, 3.5 mm. long, 1 mm. wide; *lateral ones* 5 mm. long, 1.5 mm. wide at the base, 3 mm. between apices; *mentum* slightly curved; *petals* glistening white, creamy yellow at the apex, ovate, 2 mm. long, 1 mm. wide, forming a roof under the odd sepal; *lip* deep yellow, 2 mm. long, 0.5 mm. wide at the base, tongue-like, fleshy, mobile, hinged to the end of the mentum, the margin slightly recurved; *column* jade-white, fleshy, thick, 1 mm. long, the apex truncate, with 1 arm-like process on each side of the anther (Fig. 13, G); *anther* subglobose, 2-chambered, attached to the column at the back; *pollinia* 4 in 2 pairs, each pair subglobose; *rostellum* truncate, forming the base of a U-shaped structure with the lateral processes of the column as its arms; *stigma* large, occupying a cavity covering the entire front of the column; *ovary* 1 mm. long and wide, striate-sulcate.

HONGKONG: New Territories, Taimoshan, facing west, *S. Y. Hu 12052* (Holotype K; Isotype A, US, CUH), May 30, 1972, small orchid growing on barren rock, flowers white, the sepals with golden apices, collected by R. Clibborn-Dyer; *10136* (A, CUH) May 20, 1970, cultivated in garden of Gloria Barretto, flowers pale yellow, the apices of sepals and lip orange; *N. K. Chun 40722* (K, fide Holttum) April 24, 1930.

This small saxicolous orchid was first collected by N. K. Chun from Taimoshan, and distributed by the Botanical Institute, Sun Yatsen University, Canton, China, in 1930. In January, 1969, Gloria Barretto found it again on the same mountain and brought some plants back to her orchid garden. In May the plants flowered and were taken to Chung Chi College, The Chinese University of Hongkong, for description and analytical drawings. In 1972, Ronald Clibborn-Dyer brought sufficient material for distribution to herbaria in Europe and America.

A specimen, the drawings and description were sent to Professor Holttum. His comment was: "I have examined the description, illustrations and the specimens of two orchids sent with your letter.... Regarding the *Bulbophyllum,* I agree that this is distinct from the Malayan *B. concinnum.* The Hongkong plant has broader petals, longer sepals; also is different in habitat, and the Malayan plants have roots at most of the nodes of the rhizome (several between one pseudobulb and the next) whereas the Hongkong plant roots only at the bases of the pseudobulbs".

This species is closely related to *B. kwangtungense* Schltr., from which it differs in having smaller pseudobulbs and leaves, much shorter peduncles, longer bracts and smaller flowers.

This species is named in honour of J. L. Youngsaye, who began his study of native orchids of Hongkong in the 1930's. His valuable notes, photographs and accurate knowledge of the occurrence of Hongkong orchids have been indispensable to our studies.

Cirrhopetalum Lindley

In "Notes on Cirrhopetalum Lindley" Gunnar Seidenfaden treated all the species of *Cirrhopetalum* as *Bulbophyllum.* The Hongkong species of *Bulbophyllum* and *Cirrhopetalum* are very distinct.

In *Bulbophyllum* the inflorescences are either umbelliform, with the flowers facing all directions, or solitary, or subracemose, the sepals are subequal and the petals are 2 to 6 times smaller than the sepals.

In *Cirrhopetalum* the inflorescences are subumbelliform with the flowers facing one direction, forming a fan-shaped arrangement, the odd sepal and the petals are subequal in size and the lateral sepals are 2 to 6 times longer than the odd sepal of the same flower. These lateral sepals twist, with their upper margins coherent, forming a platform before the lip. In contrast, the upper margins of the lateral sepals of *Bulbophyllum* never meet.

Authors of floras and botanical references in Eastern Asia have all kept *Bulbophyllum* and *Cirrhopetalum* separately. So as not to confuse the general readers of this area and for the morphological differences mentioned above, we recognise *Cirrhopetalum* as a distinct genus.

In this area we have two genera, *Liparis* and *Malaxis,* the differences between them are less than those of *Bulbophyllum* and *Cirrhopetalum, because both Liparis* and *Malaxis* have narrow, recurved sepals, curving filiform petals, and have elongate slender pseudobulbs and plicate venose leaves. The technical differences between these two genera are in the column and the lip. In *Liparis* the column is elongate and the lip is narrowed at the base, while in *Malaxis* the column is short and the lip auriculate. The similarities between *Ania* and *Tainia,* and between *Habenarie* and *Peristylus,* and their technical differences, are comparable to this condition. If these genera are kept separate, one should also recognize both *Bulbophyllum* and *Cirrhopetalum.*

Cirrhopetalum tseanum S. Y. Hu et Barretto, sp. nov. (Figure 14).

Herba saxicola; pseudobulbis oblique ovoideis, 1–1.5 cm. longis, 6–8 mm. diametro; foliis oblongis, 4–7 cm. longis, 1.7–2.5 cm. latis, apice retusis; scapis 8–12 cm. longis; floribus purpureo-carminatis aurantiacisque.

A saxicolous orchid. *Root* fibrous, numerous. *Rhizomes* creeping, current year's growth 1 cm. long, 3 mm. in diameter, covered by straw-coloured scales. *Pseudobulbs* oblique, ovoid, 1–1.5 cm. long, 6–8 mm. across the base. *Leaves* solitary, petiolate, the petioles 3–7 mm. long, folded, articulate at the base, laminas thick, coriaceous, oblong, 4–7 cm. long, 1.7–2.5 cm. wide, the base obtuse, apex rotundate and retuse, midrib impressed above, hardly visible beneath. *Scapes* filiform, 8–12 cm. long, 1 mm. in diameter, emerging from the base of a slightly flattened one year old pseudobulb, reddish purple, with 3 basal ovate bracts, 8 mm. long 4–6 mm. wide, and 2 sterile sheathing bracts below the middle; *flowers* 4 or 5 in a subumbelliform raceme terminal to the scape, bracts subulate, 3 mm. long, acuminate and apiculate; pedicels filiform, 4 mm. long, curved upward, uniformly shiny crimson-lake; the *odd sepal* cucullate, 5 mm. long, 4

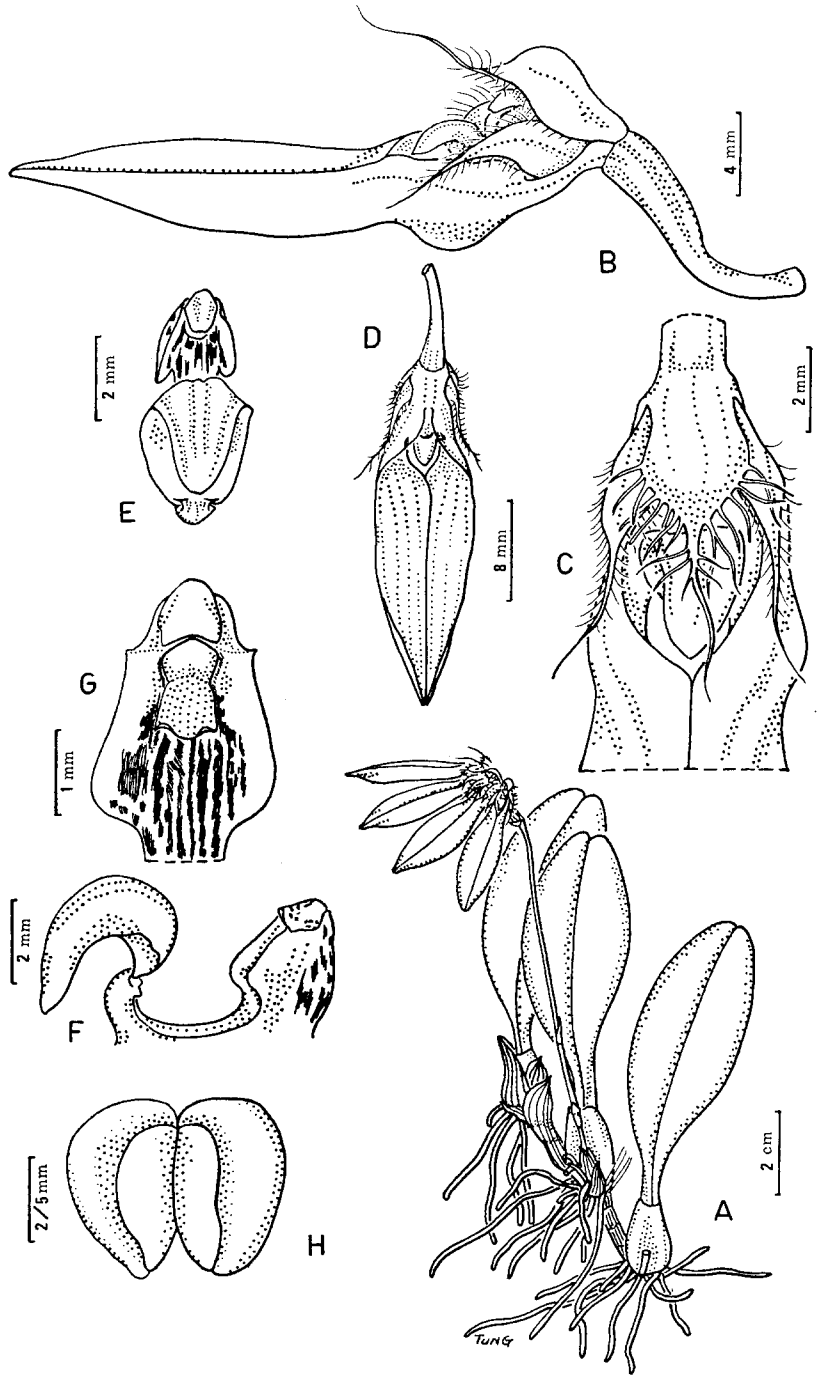

Figure 14. *Cirrhopetalum tseanum:* A. The habit sketch of a flowering plant showing 3-years' growth with numerous roots below the pseudobulb. Notice the flowering shoot emerging from the base of the second year's pseudobulb with imbricate scales at the base, and 2 sheathing sterile bracts at the lower portion. The pseudobulb of current year's growth is surrounded by imbricate membranous cataphylls. B. The lateral view of a flower showing the cucullate dorsal sepal, the lateral sepals forming a mentum at the base and then twisted upward with their upper margins meeting in front of the lip, the oblique petal, a portion of the column with anther, a portion of the lip, and the ovary. C. A portion of a flower seen from above, showing the fringed odd sepal caudate and filiform at the apex, the petals, the basal portion of the twisted lateral sepals, and the lip. D. The ventral view of a flower showing the mentum, the twisted lateral sepals recurved at the apex, and the tip of the lip. E. The front view of the column and lip showing the wings, the anther, the fleshy recurved lip with a median-longitudinal ridge and a groove on each side. F. The lateral view of the same, showing the elongated and curved column foot and the attachment of the movable fleshy lip which has a median-langitudinal ridge and 2 grooves. G. The apical portion of the column viewed from the front and slightly tipped back, showing the anther, the rostellum, and the stigmatic cavity with 3 marginal glands, a large one above and situated below the rostellum, and 2 smaller ones on the angles of the opposite margin. H. Four pollinia in 2 obovoid pairs, the outer one of the pair larger.

mm. across, light yellow and uniformly crimson-lake along the margin, ciliate, the hairs dark red, the apex extending forward to a caudate filiform process, 4 mm. long; *lateral sepals* oblique, twisted, turning upwards with the upper margins meeting in front of the lip, to form a tongue-like elliptic blade, 1.8–2 cm. long, 7–8 mm. wide, densely mottled dull purplish red and light yellow, margin yellow, recurved, and retuse at the apex; *petals* oblique ovate, 4 mm. long, 2.5 mm. wide, light yellow, dark red along the margin, ciliate and acuminate, the apex filiform, 4 mm. long; *lip* attached to the apex of the long column foot, movable, glossy orange, fleshy, tongue-like, recurved, with a median longitudinal ridge and a groove along each side; *column* 3 mm. long, stout and winged on each side; *anther* smooth, truncate at the apex; *pollinia* 4 in 2 pairs, the outer one of each pair larger than the inner pair; *rostellum* subtruncate, fleshy, and very glossy; *stigma* square, deeply concave with a large shiny gland on the upper margin, and a small one on each side of the lower margin; *ovary* obconic, 2 mm. long.

HONGKONG: New Territories, Patsin Range, Shataukok area, *S. Y. Hu 13586* (Holotype K) April 1, 1975, collected by Tse Shing Chee, rhizome creeping, 2 year-old pseudobulb bearing 2 buds, one bud on the flattened side developing into a scape with basal scales, flowers 4, column winged, stigma concave with a large glandular surface above and 2 smaller ones at the lower margin, near the angles.

We are very grateful to Peter Taylor, and his associate, J. Wood, who spent many hours going through the literature and collections at Kew, on the identification of this species. The conclusion they reached is that the orchid appears to be undescribed. Their view is that it is closely related to *Bulbophyllum morotaiense* J. J. Smith, on floral characters, but this species has smaller leaves and is from the Moluccas. In addition to geographical separation, the floral parts of the two species differ proportionately. In Smith's species the odd sepal is 7–8 mm. long, and the lateral sepals are 13–17 mm. long, while in *C. tseanum* the odd sepal is 5 mm. long, and the lateral sepals are 18–20 mm. long.

This orchid was discovered in 1974 and transplanted to his garden by Tse Shing Chee. It flowered in March this year. It is named for its discoverer.

Gastrochilus D. Don

Gastrochilus holttumianus, S. Y. Hu et Barretto, sp. nov. (Figure 15).

Herba monopodialis, epiphytica; foliis 3 vel 4, distichis, ellipticis, 4–6 cm. longis, 1–1.2 cm. latis, apice acutis, basi articulatis; inflorescentiis racemosis, floribus 2 vel 3; sepalis et petalis similaribus, carnosis, obovato-oblongis, 5 mm. longis, 2–3 mm. latis, apice rotundatis; labello saccato, apice rotundato et retuso; columna brevi, 1.5 mm. longa, 5 mm. lata; anthera globosa; polliniis 2; ovario et pedicello haud distinctis.

Epiphytic monopodial orchid. *Roots* numerous, greyish green, 2 mm. in diameter. *Stems* very short, crowed with leaves and roots. Leaves dull green, conduplicate in bud, articulate at the base and slightly papillose at the joint; laminas elliptic, 4–6 cm. long, 1–1.2 cm. wide, the apex acute, the base oblique and twisted, midrib canaliculate above, elevated beneath, margin strongly wavy. *Scapes* initiated among the roots on the side of the stem in the axil of a dried leaf, with 2 sterile bracts evenly distributed, 2 to 3 flowers crowded at the apex, the flowering bracts ovate-lanceolate, 3 mm. long, acute; *flowers* yellowish-green, *sepals* and *petals* almost similar in colour, shape and size, equally spaced, forming a semicircle behind the column, the segments fleshy, rounded at the apex, cuneate at the base, 5 mm. long, 2–3 mm. wide, the petals slightly narrower; *lip* saccate, yellowish to white, the inside very smooth, with neither calli nor keels, red at the base and dotted red here and there along the margin, the front lobe rounded, 7 mm. wide, 3 mm. high, notched at the apex, margin slightly recurved, greenish white, the middle portion yellow with red dots; *sac* rounded, 4 mm. in diameter, with a wide mouth, greenish yellow outside, dotted red inside at the base; *column* very short, red, 1.5 mm. long, 5 mm. wide across the back, adnate to the lip by a short foot; *anther* dorso-ventrally compressed, the back globular, gradually attenuate at the apex, yellow,

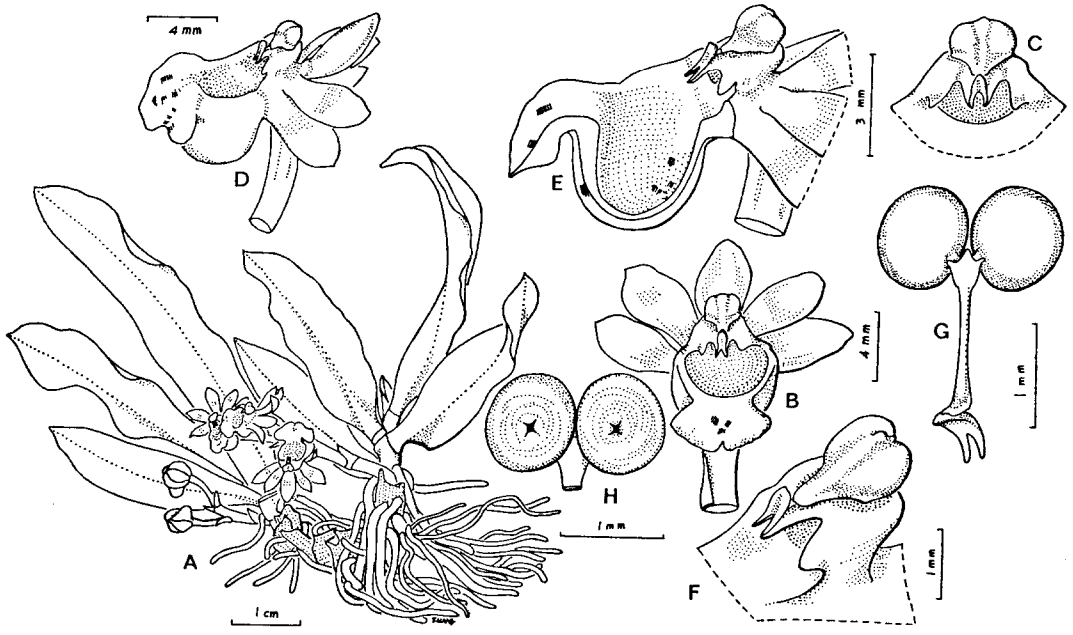

Figure 15. *Gastrochilus holttumianus:* A. The habit sketch of two flowering plants showing two shoots with roots, distichous leaves, lateral scapes and non-resupinate flowers. B. The front view of a flower showing well spaced sepals and petals, the lip, column, anther, rostellum, and the bifid viscidium. C. The front view of a column showing the anther, the rostellum, and forked viscidium. D. The lateral view of a flower showing the ventricose lip, the column, the anther, and the position of the viscidium. E. The same with portion of the sepals and petals and one-half of the lip removed, showing the smooth surface of the sac of the lip. F. The lateral view of a portion of the column showing the anther, the attachment of the stipe to the viscidium, the rostellum, and the stigma. G. The front view of the pollinia showing the stipe, the attachment of the viscidium, and the 2 pollinia appearing spherical from the front. H. The back view of the pollinia showing a flat appearance with a depression in the middle.

2 mm. wide, 1 mm. long; *pollinia* 2, front view spherical, back view slightly flat with a depression at the centre, supported by a slender transparent stipe and attached to the back of the forked *viscid disc; rostellum* glossy, 2-armed, with a glossy orange-brown spathulate disc; *stigma* mouth-like, beneath the rostellum, occupying the entire front of the column; ovary and pedical indistinct, 8 mm. long, 1.5 mm. wide, glabrous, shallowly grooved.

HONGKONG: Victoria Peak, *S. Y. Hu 12349B* (Holotype K, 1 leaf, 3 flowers, 2 on a branch, 1 drawing; Isotype A, 1 leaf, 1 colour photograph, 1 drawing) October 22, 1972. The plants were found on Victoria Peak by H. Tai in 1962, and transplanted to his garden where it flowered. In October, 1972, a flowering specimen of this species was presented to us for identification. A description and analytical drawings were prepared, and a colour photograph was taken by J. L. Youngsaye.

With the inadequate herbarium and literature in Hongkong, we sent the illustrations to T. Tang. In reply Tang wrote that it was close to *Saccolobium calceolare* (Buch.-Ham.) Lindl. On receipt of this information we consulted Holttum's book on Malayan Orchids and found this name being treated as a synonym of *Gastrochilus calceolaris* D. Don. As our specimen was very different from Holttum's description, we then sent the illustrations to Holttum for consultation. He wrote in reply: "Your specimen is not *G. calceolaris,* as you can see from the shape of the midlobe in my drawing. Your midlobe is a different shape and the midlobe of *G. calceolaris* has thick hairs on it whereas yours has none. I have looked

through the description of species of *Gastrochilus* in Schlechter's work on the orchids of China (1919) and also in Seidenfaden and Smitinand's work on the orchids of Thailand, and Gagnepain's on the orchids of Indochina, and I cannot find anything to match your plant. I think you would be justified in describing it as a *new species. . . . . the distinctive character* of the Hongkong *Gastrochilus* is the shape of the midlobe of the lip (notched at the apex) and the fact that it has apparently no hairs, calli or other excrescences, nor a fringed margin."

Holttum went on to say: "I note that it was found on Victoria Peak, Hongkong Island. It is strange that no one found it previously. *Saccolabium* is a generic name established by Blume for a small-flowered orchid from Java. Lindley included in this genus a number of other orchids which had received other generic names, and *Gastrochilus* was one of these. When J. J. Smith and others came to know more species of orchids from southeastern Asia, they decided that Lindley had lumped too many different things together under *Saccolabium,* and revised some other names which they considered to represent distinct groups deserving of generic rank. I am of the opinion that *Gastrochilus* should be recognised as a genus distinct from *Saccolablum,* though it is much nearer to the original *Saccolabium* than is *Rhyncostylis,* which Lindley also included in *Saccolabium."*

We take this opportunity of naming the new species of *Gastrochilus,* a genus hitherto unrecorded from Hongkong, in honour of Professor R. E. Holttum, the foremost orchidologist for southeastern Asia.