Vol. 34 No. 3

BULLETIN

OF THE

TORREY BOTANICAL CLUB

MARCH, 1907

Costa Rican orchids — I

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(WITH PLATES 7 AND 8)

In the months of April and May, 1906, Mr. William R. Maxon, of the U. S. National Museum, during a furlough from that institution, made, in the interests of the New York Botanical Garden, an exploration of portions of Costa Rica. Much attention was given to the collection of living plants, especially in the families *Cactaceae*, *Orchidaceae*, and *Bromeliaceae*, which furnished many specimens of great interest. The material was carefully collected and excellently packed, so that little harm came to it during the long journey, and it arrived in fine condition.

The orchids were especially well represented. Of many of these no herbarium material was secured, as at the time of collection they were not in flower. A number of these have now come into flower and others will undoubtedly do so, and it is the object of this and succeeding articles to report upon them.

Mr. Maxon gave, in the form of a report to the Director-in-chief of the Garden, an account of his explorations and many of the places visited by him, in the *Journal of the New York Botanical Garden* for August, 1906. As this may be inaccessible to many, the locations of some of the places referred to, which do not appear in the atlases ordinarily at hand, are given here, extracted in the main from Mr. Maxon's published account.

The country was entered at Port Limon, the eastern terminus of the Northern Railway of Costa Rica, which runs in a general westerly direction through the low lands of Siquirres, and then

[The BULLETIN for February 1907 (34 : 57–112, *pl. 5, 6*) was issued 9 Ap 1907.]

south and west along the gorge of the Rio Reventazon, traversing the region of Juan Viñas and Santiago. It then proceeds through Cartago to San José, the capital of the country, beyond which place Mr. Maxon did not proceed by rail. With this place as his base, excursions were made into the neighboring country, including the valley of the Rio Tirivi and the estate of La Palma, a few miles northeast of the city. While here a visit was made to Santo Domingo de San Mateo, at an elevation of about 300 meters, a little to the westward of San José, and the only locality visited west of that city. Mr. Maxon reports it as an exceedingly dry region at the time of his visit, but without a characteristic desert vegetation. A number of orchids were secured here, some of them of exceeding interest.

At Cartago, which has an elevation of about 1450 meters, considerable collecting was done, especially of living plants of orchids and bromeliads. Collections were also made at Santiago, a few miles to the eastward of Cartago. At Turrialba, on the border of the *tierra caliente*, some time was spent, and from that place a trip was made to the low humid forest on the border of the Rio Reventazon, at an altitude of about 600 meters. While at Cartago an excursion was also made to Coliblanco, an estate lying at the base of the volcano of Turrialba. One of the principal excurions while at Cartago was to the Finca Navarro, at an altitude of 1,350 meters. Navarro lies about seven miles to the southeast in a mountain valley a little lower than Cartago, at the junction of the Agua Caliente and the Rio Naranjo. Many of the orchids were secured at this point.

Judging from Mr. Maxon's collections and from recent publications, the orchid flora of Costa Rica must be exceedingly rich. It is to be hoped that explorations so well begun may be continued, for such continuation is certain to yield valuable results. Following are some of the orchids secured by Mr. Maxon, which may be safely reported upon at present.

CORYMBIS FLAVA (Sw.) Hemsley, Biol. Cent. Am. Bot. **3**: 297. 1884

Serapias flava Sw. Prod. 119. 1788.
Neottia flava Sw. Fl. Ind. Occ. **3**: 1417. 1806.

On moist forested slope, Finca Navarro, *no. 644*. Hemsley, *l. c.*, reports this from Mirador, southern Mexico, and from Chiriqui, Panama. Its detection in Costa Rica, therefore, was to be expected. Mr. Maxon in his field notes describes the flowers as yellow. This species was originally described from Jamaica.

PLEUROTHALLIS POLYLIRIA Endres & Reichenb. f. Gard. Chron. **32**: 1483. 1871

On tree bordering the Agua Caliente, Finca Navarro, *no. 702A*. This pretty species, one of the larger members of the genus, is a free bloomer, sending up usually several racemes from the same leaf. The flowers hang in a somewhat secund manner, giving the inflorescence an appearance resembling that of the lily-of-the-valley.

Originally described from fresh living material sent by W. W. Saunders to Reichenbach, who does not state from what country the plant was derived. A herbarium specimen, collected in Costa Rica by M. Endres, is, however, referred to as being the same, so that the indications are that that country is the native home of this interesting plant.

PLEUROTHALLIS MINAX Reichenb. f. Bonplandia **2**: 24. 1854

? Pleurothallis plumosa Lindl. Bot. Reg. **28**: Misc. 72. 1842.

On a tree bordering the Agua Caliente, Finca Navarro, *no. 707*. I have taken up with some hesitation Reichenbach's name for this plant, instead of that given by Lindley, who originally described the flowers as "green, with a little purple dotting on the inside," and gave the home of his plant as Trinidad. Later (*Folia Orch. Pleurothallis* 27. 1859) he makes this statement: "Flowers green in gardens, orange coloured wild," and refers to his species a specimen collected by Fendler in Venezuela, *no. 2152*, and also material secured by Wagener at Caracas. He further remarks thus: "The dissection of a flower of his *P. minax* given me by Prof. Rchb. and Fendler's specimens show that plant not to be distinct from *P. plumosa*." A specimen secured by Wagener at Caracas, at an elevation of 5000 feet, and presumably the one to which Lindley refers above, was the basis of *P. minax*. The plant which Mr. Maxon secured came into flower in the early part of November of

last year, the flowers being of a dull orange, thus closely approaching the "dottergelb" applied by Reichenbach in describing the color of the flowers of his species, and incidentally showing that the Costa Rican plants, at all events, do not produce green flowers in cultivation. So it does not seem possible to reconcile this with the green flowers originally accredited to *P. plumosa*, nor does it seem likely that a plant from Trinidad should be identical with one from an elevation, in practically the same latitude, of 5000 feet. The short velvety pubescence of the peduncle, axis of the raceme, bracts and flowers, and the color and details of the flowers, especially those of the lip, of *P. minax* so closely coincide with those in Mr. Maxon's plant that I cannot but place it there, rather than take up for it the name of *P. plumosa*, as done by Hemsley (Biol. Cent. Am. Bot. **3**: 201. 1883) for a specimen collected by Wendland, also in Costa Rica. Perhaps Lindley was wrong as to the color of his flowers, although he indicates that he was dealing with fresh material, or he may have been mistaken as to the country from which the material came — at all events, it seems better now to adopt for this Costa Rican plant a name which can be applied with some certainty, rather than a doubtful one. A comparison with Lindley's type may some time definitely settle the question.

ISOCHILUS LINEARIS (Jacq.) R. Br. in Ait. Hort. Kew. ed. 2. **5**: 209. 1813

Epidendrum lineare Jacq. Select. Stirp. Am. Hist. 221. *pl. 131. f. 1.* 1763.

Partially shaded rocky bank, Santiago, *no. 108*. Widely distributed in tropical America, but originally described from Martinique.

PONERA AMETHYSTINA Reichenb. f. in Saund. Ref. Bot. *pl. 93*. 1869

Santo Domingo de San Mateo. On tree-trunk by Rio Machuco, *no. 545*; and on tree trunk near Rio Grande, *no. 570*. This region is described by the collector as an exceedingly dry one but without a characteristic desert vegetation. An interesting find. The plant was originally figured and described from living material, secured by Mr. Skinner at Santa Fé de Veraguas,

Panama, which flowered in the collection of Mr. W. W. Saunders. Its detection in the above locality extends its range considerably to the north and west of its place of discovery. The flowers in our specimens have the sepals and petals more acute and the terminal lobe of the lip somewhat narrower than indicated in the plate referred to above, but they agree essentially in all the other particulars. The hollow at the base of the column, represented in the drawing and rather questionably referred to by Reichenbach, is quite manifest in the flowers of the Costa Rican plant. The lip, however, has no such hollow at the base, but, on the contrary, is noticeably thickened at that point.

EPIDENDRUM COCHLEATUM L. Sp. Pl. ed. 2. 1351. 1763

On trees in humid forest, Santiago, *no. 101*. On tree-trunk in forest, Turrialba, *no. 179*. Quite widely distributed in tropical America, ranging from southern Mexico to Venezuela, and common in the West Indies; also frequent in southern Florida.

The type locality is the Bahamas. Linnaeus appears to have had two things in his species. He gives three citations, as follows: Sloane, Jam. 250. *pl. 121. f. 2*; Catesby, Car. **2**: 88. *pl. 88*; and Plum. Pl. Am. Icon. *pl. 185. f. 2*. In his description he says: "nectario cordato." This effectually disposes of the first citation above, as that figure has a broadly obcordate or almost orbicular lip. The plant is figured, moreover, with very short round pseudobulbs, and has the sepals and petals represented as much broader and of a different shape than those in the plant commonly accepted as this species. The flowers are also described by Sloane as "reddish purple." One could hardly mistake this figure for what is commonly known as *E. cochleatum*. The other two figures cited represent what has been widely known as this species, that of Catesby being in color and allowing of no doubt. The lip is also decidedly cordate, as called for by Linnaeus, thus permitting us to retain the common conception of this species. Catesby's plant was from the Bahamas, and Plumier gives no origin for his, but cites Catesby's plate; the type locality is thus pretty clearly as indicated above.

EPIDENDRUM OCHRACEUM Lindl. Bot. Reg. **24**: Misc. 14. *pl. 26.* 1838

On trees in humid forest, Santiago, *no. 104.* First received by Lindley from the garden of Sir Charles Lemon, who received the living material from George U. Skinner, who had collected it in Guatemala. It is widely distributed in Central America.

EPIDENDRUM PALEACEUM (Lindl.) Reichenb. f. Beitr. Orch. Cent. Am. 80. 1866

Dinema paleaceum Lindl. Bot. Reg. **26**: Misc. 51. 1840.
Epidendrum auritum Lindl. Bot. Reg. **29**: Misc. 4. 1843.

On branches of fallen tree-tops, Turrialba, *no. 164.* Rather extensively distributed from Guiana to southern Mexico, and originally described from Guatemalan material. This is the second time this little species has been brought to us by collectors; Mr. Percy Wilson secured it in Honduras in 1903. It is interesting to note that Wendland also obtained specimens of this plant at Turrialba in 1857.

LAELIA RUBESCENS Lindl. Bot. Reg. **26**: Misc. 20. *pl. 41.* 1840

Under cultivation in the garden of Mr. P. Biolley, at San José, *no. 358.* Mr. Biolley secured the plant in January of the same year at Uricuaja, on the Pacific coast, at an altitude of about 200 m. When this species was first described its native country was unknown, but it was supposed to be Mexico, a supposition which was later verified. Owing to the variability of its flowers and pseudobulbs, two species described subsequently by Lindley, *L. acuminata* and *L. pedunculares*, are usually referred here. Under this broad conception it ranges from Mexico throughout Central America to Costa Rica.

EPIDENDRUM STAMFORDIANUM Batem. Orch. Mex. & Guat. *pl. 11.* 1838

On horizontal branch of a tree, Santo Domingo de San Mateo, *no. 600A.* This came mixed with a fine plant of *Schomburgkia* sp. (*no. 600*). Another specimen, *no. 355*, which was under cultivation at San José, was also secured from Mr. P. Biolley, in whose

garden at that place it was. Mr. Biolley secured it at Uricuajo, at an altitude of about 200 m., on the Pacific coast, in January of the same year.

The species was originally found by George U. Skinner along the shores of Lake Izabal, near Izabal, Guatemala. He sent plants in 1837 to England, where they flowered the following year, furnishing the material from which the original description and illustration referred to above were drawn. The flowering of this plant caused considerable excitement among the orchidologists of that day, as it was the first member of the genus known in which the inflorescence was not borne at the apex of the leafy stem. In this species, as well as in several others, the inflorescence is borne upon a leafless stem arising from the base of the leafy pseudobulb.

Mr. Skinner remarks (Batem. Orch. Mex. & Guat. *l. c.*) that the plant is known in its native country as "quartorones," in allusion to the four colors of its blossoms. The flowers of the plants which have blossomed in the New York Botanical Garden have undergone remarkable changes in color as they faded, the white of the lip passing into yellow and buff, and various combinations of these, produced by stripes, spots and blendings.

Elleanthus caricoides sp. nov. (PLATE 7)

A densely tufted plant, smooth and glabrous with the exceptions noted below, with numerous gracefully drooping slender stems. Stems 4 dm. long or less, round, about 1.5 mm. in diameter at the base, sparsely spotted with purple: leaves 5–7; sheaths grooved, much shorter than the blades, spotted with purple, the lower 2 or sometimes 3 soon turning brown, bladeless or with but rudimentary blades; blades flat, about 7-nerved, erect, somewhat twisted and recurved above the base, linear-lanceolate to linear, shining, long-acuminate at the apex, narrowed toward the base, 1–2 dm. long, the lowermost sometimes a little shorter and the one immediately below the inflorescence often but 4–6 cm. long, 7–8 mm. wide: inflorescence 2–3 cm. long, on a peduncle less than 1.5 cm. long, the bracts, the lowermost one of which is usually empty, ovate-lanceolate, green, apparently spirally arranged, long-acuminate, 2–3 times as long as the flower, nearly erect and somewhat recurved above the middle; flowers, including the ovary which is 2–3 mm. long and more or less appressed-pubescent with black-brown hairs, about 1 cm. long, gibbous on one side: lateral sepals 7–8 mm. long, about 3 mm. wide, oblong to oblong-oval,

rather abruptly contracted above into a laterally compressed and keeled apex, more or less pubescent on the back with black-brown deciduous hairs, about 5-nerved; dorsal sepal 5–6 mm. long, and about 2 mm. wide, the compressed apex much less prominent: petals oblong-linear, somewhat dilated at the rounded and apiculate apex, 6–7 mm. long, 1.5–2 mm. wide: lip nearly campanulate, completely surrounding the column so that its margins meet, about 7–8 mm. long, when spread out 10–12 mm. wide at the truncate and sparingly ciliate apex and 5–6 mm. wide at the base, a 2-ridged crest just below the middle, the two appendages near the base of the lip oblong, papillate, 1.5–2 mm. long and about 1 mm. wide: column 7–8 mm. long, 4-toothed at the broadened apex.

On the lower horizontal branch of a tree bordering the Agua Caliente, in the humid region, upon the Finca Navarro, *no. 692*.

CATASETUM MACULATUM Kunth, Syn. Pl. Aequin. **1**: 331. 1822

Cultivated at San José, *no. 352*. Another species which Mr. Maxon secured from Mr. Biolley, who secured it at San Mateo, on the Pacific coast. It flowered with us first on November 23 of last year. This material very closely agrees with the description of Kunth, also with the details of the figure published (H. B. K. Nov. Gen. & Sp. **7**: *pl. 630*). The parts are not so green as called for in that description, and this perhaps accounts for Mr. Maxon receiving the plant under the name of var. *luteopurpurata* Cogn., a name, however, of which I can find no record of publication. Mr. Percy Wilson, who visited Honduras in 1903 in the interests of the New York Botanical Garden, also obtained living material of the same species which has flowered at the Garden.

Catesetum maculatum was found first near Turbaco, Colombia, at an altitude of about 324 m. I cannot think, however, that the *C. maculatum* of Bateman (Orch. Mex. & Guat. *pl. 2*) is the same thing, for the setae of the column are described and figured as very short, quite different from the very long ones in the true *C. maculatum* Kunth. The *C. maculatum* of Lindley (Bot. Reg. **26**: *pl. 62*. 1840) seems to be different also; the color of the flowers is quite different and the petals are entire, while in the plants from Costa Rica and Honduras these parts are decidedly serrated, thus agreeing with the original description of Kunth.

CYCNOCHES ROSSIANUM Rolfe, Gard. Chron. **69**: 456. 1891

On tree-trunk at border of forest, vicinity of Rio Reventazon, Turrialba, *no. 172*. A most interesting find. Rolfe drew his description from material secured from a plant which flowered in the collection of Signor H. J. Ross, Poggio Gherardo, Florence, Italy, in 1889. This plant was purchased for *C. Warscewiczii*, quite another species with pure green staminate flowers, represented by a living plant in the collections of the New York Botanical Garden. The native country of the original plant of *Cycnoches Rossianum* was not known, and it is interesting to have its home thus revealed. The plants which Mr. Maxon brought back with him have produced up to the present time only staminate flowers, which agree with the description given by Mr. Rolfe.

The staminate racemes are long and slender, in the Costa Rican plant measuring up to 6 dm. long with the flowers rather scattered. The sepals and petals are yellowish-green, heavily blotched with purple-brown, as described by Rolfe, who says further that the pistillate raceme he examined had but a single flower which was about twice the size of the staminate flowers and of a uniform green color with a slightly darker shade on the lip.

XYLOBIUM FOVEATUM (Lindl.) Stein, Orchideenb. 597. 1892

Navarro, *no. 674*. This was originally described from plants secured in Demerara. Cogniaux (Mart. Fl. Bras. 3^5: 470) gives its range as extending to Venezuela, Peru and Colombia. While the Costa Rican material differs somewhat from the South American plant, judging from descriptions, it seems best for the present to refer it to the same species.

Maxillaria Valenzuelana (A. Rich.)

Pleurothallis Valenzuelana A. Rich. in Sagra, Hist. Cuba **11**: 234 1850.

Dicrypta iridifolia Batem.; Loud. Hort. Brit. Sec. Add. Suppl. 630. 1839. Name only.

Maxillaria iridifolia Reichenb. f. Bonplandia **2**: 16. 1854.

On tree trunk, Cartago, *no. 53*. Cogniaux (Mart. Fl. Bras. 3^6: 78) gives the distribution of this plant as extending from Brazil to Colombia and Cuba. Its discovery in Costa Rica therefore extends the range to the continent of North America.

As indicated above in the synonymy, the first name applied to this plant is a nomen nudum; the origin of the plant was attributed to Trinidad. The first adequately published name seems to have been *Pleurothallis Valenzuelana*, described from Vuelta de Abajo, western Cuba. Reichenbach, *l. c.*, states that his plant came from Cuhobas, Cuba, and indicates that it was collected by Pöppig. Pöppig employed his time as a botanical collector and physician, his botanical activities being principally confined to Matanzas and S. Elena, near Cahoba and the territory to the south and the southwest (Urban, Symb. Ant. **1**: 130). The type locality of this plant is, therefore, whether one adopt the name of Richard or that of Reichenbach, western Cuba.

Zygostates costaricensis sp. nov. (PLATE 8)

Plant grayish-green. Stem very short: leaves grayish-green; lower ones widely spreading, the upper ones ascending to erect; sheaths equitant, 1–2 cm. long, their margins hyaline; blades articulated to the sheath, inequilaterally lanceolate or oblong-lanceolate, sometimes slightly falcate, acute, laterally compressed, 1.5–4 cm. long, 4–10 mm. wide: inflorescence axillary, racemose, the rachis densely hispid with spreading hairs of variable length, the spreading bracts, both those at the base of the rachis and those subtending flowers, broadly ovate to orbicular, acute, about 2 mm. long, partly clasping the rachis, ciliate on the margin with glandular hairs: flowers not crowded, on hispid pedicels which are shorter than the bracts: sepals free, orbicular, wing-keeled on the back, about 2 mm. in diameter, obtuse, the keel ciliate with a few teeth, the body of the sepals on the back sparingly hispid: petals orbicular, about 2 mm. long including the short claw, keeled and sparingly hispid on the back: lip papillose, incurved and arching over the flower, concave, 4–5 mm. long when straightened out, green at the base, slightly dilated above where it is about 1 mm. wide when spread out, acute at the apex: the 2 appendages about 1 mm. long, spreading like a ram's horns, white, papillose, flattened, somewhat dilated toward the obtuse apex: column very slender and weak, bent back, geniculate, the rostellum with a long crooked beak which is recurved into a semicircle about the middle: anther of the general shape of the rostellum and somewhat exceeding it in length, and with a recurved tip: pollinia 4, on a long slender stipe which is bent back upon itself toward the apex.

On tree-trunk in forest, Finca Navarro, *no. 680*. The most interesting plant revealed thus far in Mr. Maxon's collections.

The herbarium material of this plant brought back still had the old racemes attached, but all the flowers were missing, so it was impossible to place it satisfactorily. Fortunately Mr. Maxon succeeded in securing some good living plants. These throve and came into flower in October of last year. This supplied the needed material for a definite determination of the plant. It was interesting to find that it belonged to the genus *Zygostates*, known hitherto only from Brazil and Paraguay, and that it was also an undescribed species. Another genus is thus added to the orchid flora of North America.

Zygostates is closely related to *Ornithocephalus*, which ranges from northern South America and Trinidad through Panama and Central America, with one or two outlying species in Asia and Australia. It is distinguished from *Ornithocephalus* by the two appendages near the base of the column. The structure of the column and the unusual lip of this Costa Rican member of the genus differ considerably from the same organs in other species of the genus, but it seems best, at least for the present, to refer it here.

WARSCEWICZELLA WENDLANDII DISCOLOR Reichenb. f. in Warn. & Will. Orch. Alb. 3: *pl. 126.* 1884

On trees in humid forest, Santiago, *no. 105;* on tree-trunk, Cartago, *no. 55.* This interesting color-variation, in which the sepals and petals are pale-green instead of white, was first noted in a plant that flowered in the collection of Mr. A. H. Smee, in England. It is a very desirable plant, as it flowers freely, and for a long period. The contrast of the lavender of the lip with the pale-green petals and sepals is most effective. It also has the added value of a pleasant perfume.

NEW YORK BOTANICAL GARDEN.

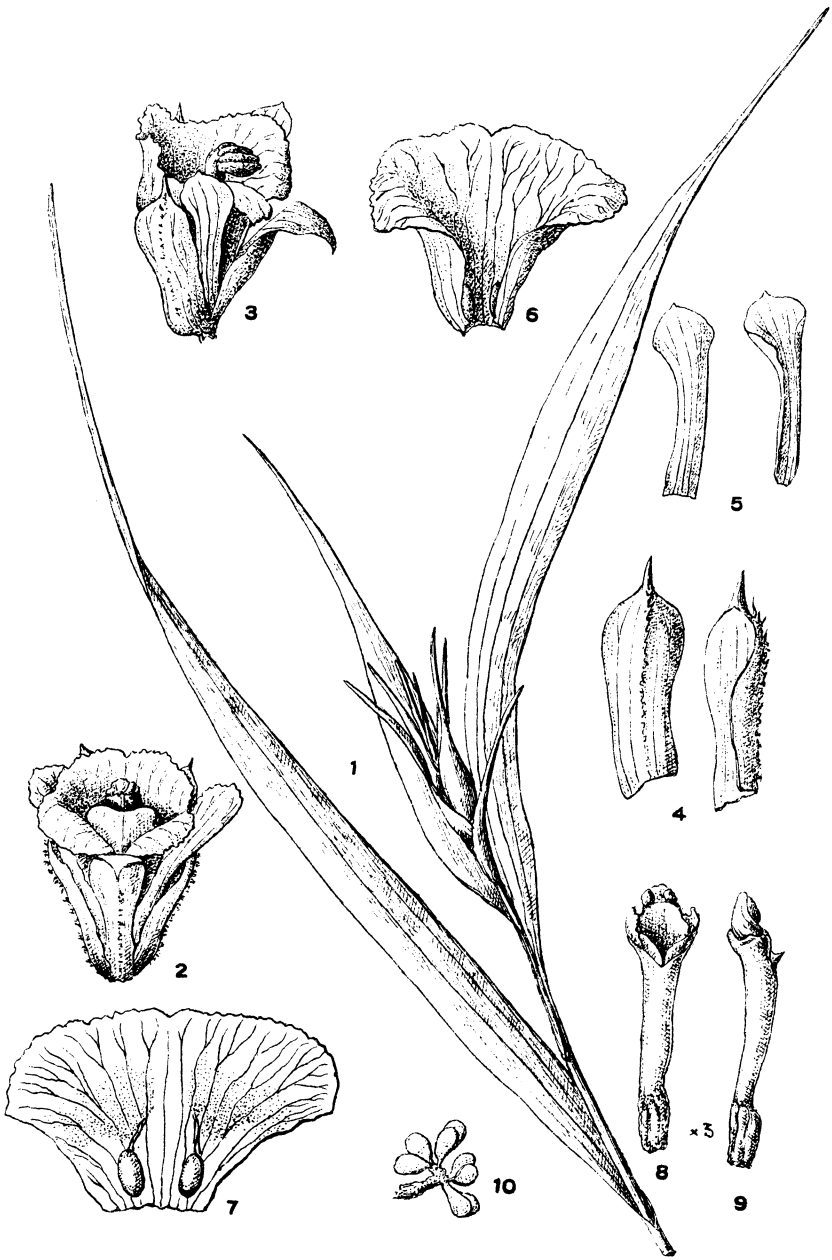
Explanation of plates 7 and 8

PLATE 7. ELLEANTHUS CARICOIDES Nash

1. Apex of stem, natural size. 2. Flower, dorsal view, × 3. 3. Flower, lateral view, × 3. 4. Sepals, × 3. 5. Petals, × 3. 6. Lip, × 3. 7. Lip, spread out, × 3. 8. Column, anterior view, × 3. 9. Column, lateral view, × 3. 10. Pollinia, × 8.

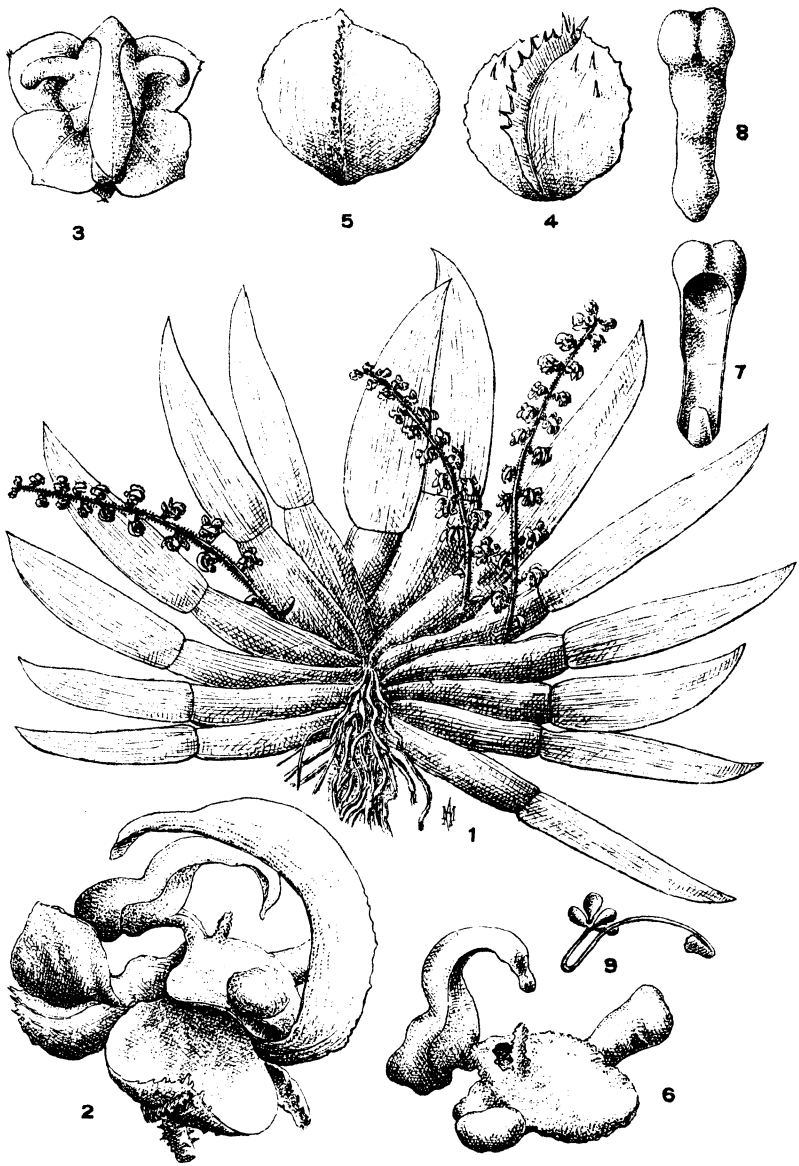
PLATE 8. ZYGOSTATES COSTARICENSIS Nash

1. Plant, natural size. 2. Flower, lateral view, × 16. 3. Flower, from above, × 8. 4. Sepal, × 16. 5. Petal, × 16. 6. Appendages, column and anther, × 16. Anther, from below, × 16. 8. Anther, from above, × 16. 9. Pollinia, × 16.



ELLEANTHUS CARICOIDES Nash.

HELIOTYPE CO., BOSTON.



ZYGOSTATES COSTARICENSIS Nash.

HELIOTYPE CO., BOSTON.