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REVISION OF THE GENUS *CATANThERA* F.v. MUELL.  
(MELASTOMATACEAE)

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ABSTRACT

A historical sketch of the genus *Catantlicra* is presented and its relationship with the two allied genera *Dissochaeta* Bl. and *Medinilla* Gaud, is discussed. The 16 species recognised in the genus *Catantlicra* are described and a key to the species so far known is presented. The genus *Catanthera* is entirely restricted to Malesia, occurring in New Guinea, Borneo and Sumatra. They are ivy-like climbers which form a canopy in the tropical rain forests. Five new species, *Catanthera royenii* Nayar, *C. pilosa* Nayar, *C. novoguineensis* Nayar, *C. Hleuineri* Nayar and *C. peltata* Nayar are described and **illustrated**.

ABSTRAK

Sejarah singkat *Catanthera* disttjikan dan kekerabatannya dengan marga-marga *Dissochuesta* Bl. dan *Medinilla* Gaud, **dibahas**. Ke-16 jenis yang diakui dipertelakan dan kunci determinasinya diberikan pula. **Marga** ini terbatas penyebarannya di Irian, Kalimantan dan Sumatra, liana yang menghuni tajuk pohon di hutan **basah** tropik. Lima jenis baru, *C. royenii* Nayar, *C. pilosa* Nayar, *C. vnovguineensis* Nayar, *C. slewmeri* Nayar dan *C. peltata* Nayar diusulkan.

INTRODUCTION

The genus *Catanthera* was founded by F.v. Mueller (*in Journ. Bot.* 24: 289, 1886) on the basis of specimens *Forbes 419* and *Forbes 451* from New Guinea which have the remarkable ivy-like habit, the extra-ovarial chambers descending to the base of the ovary and the stamens with distinct dorsal and ventral appendages. Mueller's description of the genus was quite good, but he erroneously assigned the genus *Catanthera* to the Family Vacciniaceae (Nayar *in Gard, Bull, Singap.* 24: 851, 1969).

The genus was described again as *Hederella* by Stapf in 1895 (Hook f. Ic. Pl. 25: t. 2415 & 2416) on the basis of *Hederella multiflora* Stapf, *H. tetrandra* Stapf, *H. quintuplinervis* (Cogn.) Stapf and *H. forbesii* Stapf. And Stapf appropriately assigned the genus *Hederella* to the family Mekistomataceae and placed it in the tribe Dissochaetea. While establishing the genus *Hederella*, Stapf observed that Cogniaux's *Dissochaeta quintuplinervis* differs from other *Dissochaeta*s in its trailing habit with its long, slender and wavy branchlets and the flexuose stem. Stapf (1895) correctly commented that "this species would represent a very peculiar type of *Dissochaeta*, if left in that genus, so **peculiar** indeed, that its deviation from the remainder of the genus would be quite equivalent to the differentiation on which the genera of *Dissochaetae* altogether rest. This alone would suffice to raise *Dissochaeta quintuplinervis* to the type of a new genus .... As to the affinity of the genus *Malantos*, I believe it lies more with *Medinilla* than with *Dissochaeta*." Apparently Stapf changed his mind regarding the name of the new genus and he gave a new name '*Hederella*' later on. This is evident from Stapf's annotations in the type specimens *Beecari ISO2*, *Beecari 3274*. at Kew.

Gilg (*in Engl. & Prantl. Pflanzenfam. III 7: Nachtr, 266, 1897*) referred Stapf's genus *Hederella* to *Dissochaeta* as he considered the connective similar to that of *Dissochaeta*. Mansfeld (*in Engl. Bot. Jahrb. 60: 113, 1926*) combined *Hederella*, with *Medinilla*. Bakh. f. (I.e. 26, 1943) with hesitation referred *Hederella* to a section of *Medinilla* since in his opinion it is more allied to *Medinilla* than to *Dissochaeta*-. However he could not consider its character in his diagnoses on account of insufficient material.

In 1925 Mansfeld (I.e.) established the genus *Phyllapophysis* on the basis of *Schlechter 20117* from New Guinea. In the key to the Papuan *Dissochaeteae* (in l.c.p. 113) Mansfeld grouped the new genus with *Omphalopus* Naud., on the basis of phylloid dorsal appendage and reticulate anthers. The shape and orientation of the phylloid appendage in *Omphalopus* is quite characteristic and it is in no way related to this taxon. The anther in *Omphalopus* is reticulate with bullate thecae, whereas in this species the anthers are not reticulate. It is presumed that Mansfeld might have **been** misled by the shrunken anthers in the herbarium material. The nature of the staminal appendages, the extra-ovarial chambers descending to the base of the ovary and the ivy-like habit clearly indicate that the taxon *Phyllapophysis schlechteri* should be assigned to the genus *Catanthera* and hence the genus *Phyllapophysis*

is reduced to a synonym of *Catanthera*. (Nayar I.e.) Since a validly published generic name *Catanthera* F.v. Mueller (1886) is available for this homogeneous group of species Nayar (I.e.) reduced *Hederella* to the synonymy of the genus *Catanthera*.

The genus *Catanthera* is closely allied to both *Medinilla* and *Dissochaeta*. The diagnostic characters of *Dissochaeta*, *Medinilla* and *Catanthera* are given in Tabel I.

Table L Diagnostic characters of *Dissochaeta*, *Medinilla* and *Catanthera*.

<i>Dissochaeta</i>	<i>Medinilla</i>	<i>Catanthera</i>
Stamens 4 or 8; equal or unequal; Isomorphic (same shape for both large and small stamens). Anther ends dorsally in a, triangular appendage and ventrally in two or more setose appendages.	Stamens 8; equal or subequal or unequal; Isomorphic. Anther ends dorsally in a spur and ventrally in two lobes, or in a pen- <b>diculate</b> .	Stamens 4 or 8; equal if 4; unequal if 8; Dimorphic. Anther (large) <b>ends</b> dorsally in a triangular or rounded appendage and ventrally in two subulate appendages or lobes.
Connective shortly produced.	Connective not produced.	Connective usually produced; rarely not produced.
Extra-ovarial chambers 8, all descending to the base of the ovary.	Extra-ovarial chambers 8, not descending beyond the middle of the ovary.	Extra-ovarial chambers 4 or 8, all <b>descending to</b> the base of the ovary.
Climbers or lianas.	Epiphytic or terrestrial shrubs or climbers.	Epiphytic with ivy-like habit.

The genus *Catanthera* is entirely restricted to Malesia with nine species in New Guinea, seven species in Borneo and one species in Sumatra.

#### CATANTHERA F.V. Muell,

*Catanthera*, F.v. Muell. in Journ. Bot. 24: 289, 1885; Nayar in Gard. Bull, Singap, 21: 351. 1969.

*Hederella* Stapf in Hook. f. Ic. Pl. 25: t. 2415. 1895; Nayar in Kew Bull. 20: m. 1966.

*Phyllapophysis* Mansf. in Enfl. Bot. Jahrb. 60: 113. 19213.

Epiphytic **climbers** with **ivy-like habit**, Branches striate, angular, flexuose, glabrous, furfuraceous or pilose. Leaves opposite or alternate, ovate or ovate-oblong or elliptic, base subcordate or rotund or acute, apex shortly acuminate or obtuse or rotund, margin entire, **glabrous** or densely furfuraceous or pilose, 3-7 nerved. Inflorescence axillary, usually umbellate or paniculate or solitary. Calyx tube ovoid or obovate, glabrous or densely pilose, limb truncate or dentate. Petal oblong or ovate-lanceolate. Stamens 4 or 8; if 4 the stamens are equal and isomorphous; if eight the stamens are unequal and dimorphous; large stamen; anther lanceolate or oblong, connective usually produced, rarely not produced, ending dorsally in a triangular spur or appendage and ventrally in two subulate appendages; small stamen: anther oblong or lanceolate or **linear**, connective hardly produced, dorsally calcarate and ventrally in two linear or subulate appendages. Ovary crescent with the calyx tube by 4 or 8 seeds, extra-ovular chambers 4 or 8, all descending to the base of the ovary. Style filiform, stigma **punctiform** or inconspicuous. Fruit baccate.

TYPE SPECIES: *Catanthera lysipetala* F.v. Muell.

#### KEY TO THE SPECIES OF CATANTHERA

1. Calyx tube truncate
  2. Leaf not peltate
    0. Stamens 8.
      4. Large anthers ovate or lanceolate
        5. Large anthers ovate; Inflorescence paniculate . . . . . *I. C. paniatiata*
        6. Large anthers lanceolate; Inflorescence not paniculate, usually umbelliform, rarely solitary or in threes
        - fi. Under surface of leaf stellate-furfuraceous,
          - T. Connective of large stamens prominently produced 0.8—2.8 mm long.
            8. Leaves 3-veined; petiole 4—5 mm long; leaves 2—2.7 cm X 1.6—2.2 cm; petiole 4—n mm long, peduncle 0.8—1 cm long; pedicel 0.8—1 cm long . . . . . 2. *C. nvtth*
            8. Leaves 5-veined; petiole more than 10 mm long.
      9. Small anthers lanceolate-
        10. Calyx tube obovate, 7—8 mm long; limb dilated; calyx wall 0.2 mm wide; peduncle 0.5—0.7 cm long; pedicel 4—5 mm long connective of large anthers 2 mm long; dorsal appendage of large anther short 0.1 mm long . . . . . 3 . . . . . *C. quintuplinervis*
        10. Calyx tube **cylindrical**, 5—9 mm long; limb not dilated; calyx wall 1 mm wide; peduncle 4.5—5.5 cm long; connective of large anthers 0.8 mm long; dorsal appendage of large anther triangular 1—1.3 mm long . . . . . 4. *C. pilota*
  - 0). Small anthers oblong
    11. Leaves ovate, 3—7 cm X 2.3—6 cm; large anther 6 mm long 2.5 mm wide; connective of **large** anther produced 2.8 mm long, dorsally ending in an appendage 0.5—0.8 mm long and ventrally ending in two subulate appendages 0.8—1 mm long . . . . . 5. *C. wavoguiwee-mk*

- 11. Leaves **elliptic**, H5—5.5 em x 2—3 cm; largo anther 6—7 rum lonft, 1.2 mm wide; connective ol<sup>l</sup> largo anther produced 1 mm long, dorsally (tiding in a **triangular** append ape 1 mm long and **ventrally** ending in two subulate appendages 1 mm long . . . . . C. *C. brasxif*
- 7. Connective of large stamens **hardly** produced <0.2 **tarn long**). 7. C. *royenii*
- G. Undersurface of leaf** ghtbrous. . . . . 8. C. *lovgixtylix*
- 1. Large anthers oblong
- 12. Connective of large stamens produced 2.5 mm long; leaf 7-nc-rved. . . . . 9. C. *lyftipetala*
- 12. **Connective** of large stamens produced 0.5 mm |a|%| leaf u- or 5- veined.
- 13. Leaves 5-veined, under surface glabrous?; **calyx** tubu 5 mm long, ovoid, srlabrous; **petals** lanceolate S mm X £.5 mm; pedicel 15—25 mm long, . . . . . 10. C. *multiflitni*
- 13. Leaves ^-veined, undersurface of leaf stellate-furfuraceous, calyx tube 1—3 mm long, obconic, stellate-furfuraccous; petals i> mm x 2,5 mm; pedicel 5—7 mm long.. . . . . 11. C. *kindbaluentis*
- 3. Stamens 4. . . . . 12. C. *tetrandni*
- 2. Leaf peltate; leaf ovate, 17 em X 8 cm, base rounded apex acuminate ]3. C. *peltafa*
- 1. Calyx tube lobed or dentate
- 14. Calyx tube 4 dentate, teeth 1.5 mm long; ealyx tube 5—7 mm Jong; inflorescence umbuliform. . . . . 14. C. *endertii*
- 14. Calyx tube 4 lobed, lobes 4—6 mm long, calyx tube 12—15 **nan** long; flowers solitary
- 15. Leaf ovate, base rounded, apex caudate-acuminate, 7-veined; calyx tube with lanceolate lobes; stem, leaves **and** inflorescence covered with 5—6 min long fulvous pubescence; pubescence persistent; hairs sparsely branched. . . . . 15 C. *alemricri*

Table II. Distribution pattern of species of *Catcmthera*, — Fig. 1.

Species	Sumatra	Borneo	New Guinea
1. <i>paniculate</i>		+	+
2. <i>endertii</i>		+	
3. <i>lysipetala</i>			+
4. <i>tetrandra</i>		+	
5. <i>multiflora</i>		+	
6. <i>longistyMs</i>			+
7. <i>royenii</i>			+
8. <i>hinabahtenxi</i> <sup>^</sup>		+	
9. <i>pUoaa</i>		+	
10. <i>ovata</i>			+
11. <i>vovoyHincensis</i>			+
12. <i>brassii</i>			+
13. <i>qtihtitplinervis</i>	+	+	
14. <i>sleiuneri</i>			+
15. <i>sehteKieri</i>			+
16. <i>peltatu</i>		+	

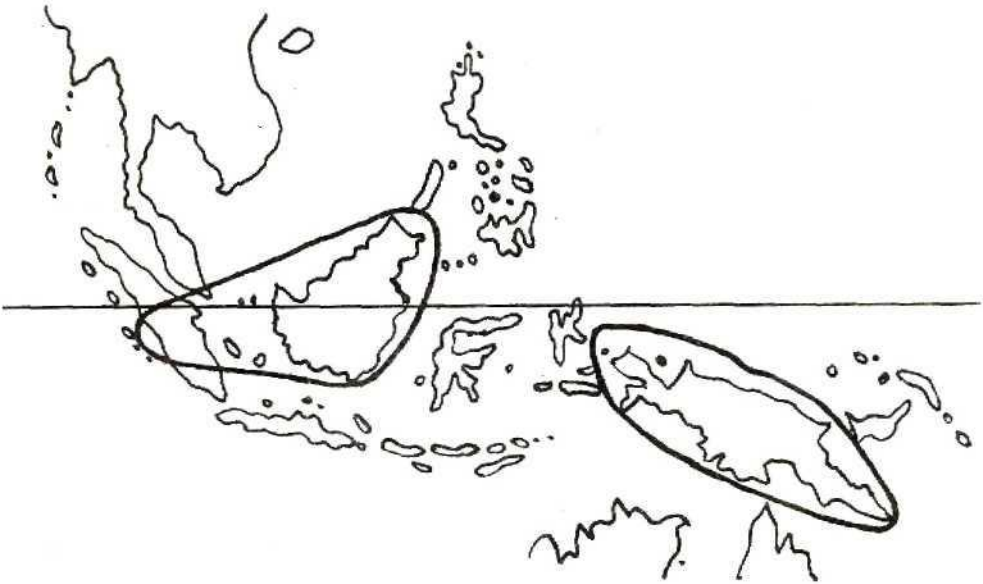


FIG. 1. Distribution of genus *Catanthera* F.V. Muell,

15. Leaf elliptic, base obtuse, apex acuminate, 5-veined; calyx tube with linear lobes; stem, leaves and inflorescence covered with 2—3 mm long ferrugineous pubescence; glabrescent in patches; hairs densely branched. 16. *C. schlechteri*

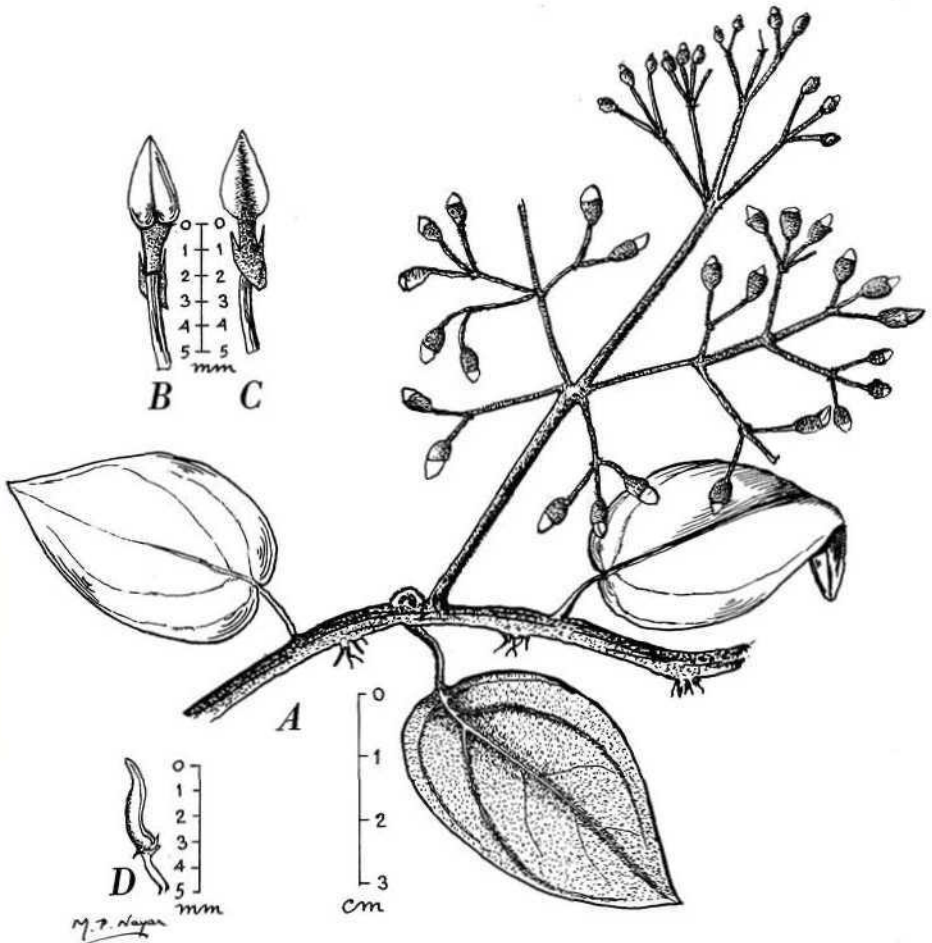
The species of *Catanthera* show considerable morphological variations in numerous characters. Apart from one pair *C. sleumeri* and *C. schlechteri*, the remaining species can be easily and satisfactorily differentiated on the characters of the androecium, in addition to other features like the shape of the calyx tube, the shape of petals and the nature of inflorescence.

The genus *Catanthera* is entirely restricted to Malesia occurring in Sumatra, Borneo and New Guinea. The main centre of distribution is New Guinea with 9 species, all endemic to the region. Borneo has 7 species and of which 6 are endemic. The common species occurring in Borneo and Sumatra is *C. quintuplinervis*. It is interesting to note that so far no species of *Catanthera* has been recorded from Java and Celebes. The species of *Catanthera* are ivy-like climbers which form a canopy in tropical rain forests.

1. *CATANTHEKA PANICULATA* (Nayar) Nayar. — Fig. 2.

*Catanthera paniculata* (Nayar) Nayar in Gard. Bull. Singap. 24: 358. IP69. — *Hederetta paniculata* Nayar in Kew Bull. 20: 239. 1966. — Typus: New Guinea, Carr 14189 (holotype BM, isotype K).

Epiphytic climber. Branches annulate, stellate-plumose furfuraceous. Leaves ovate, 4—5 cm x 2.5—3 cm, base subrotundate or obtuse, apex acuminate, upper surface glaucous, under surface along the nerves densely stellate-furfuraceous, in between the nerves sparsely furfuraceous. 5-nerved, cross-venules on the upper surface sub-distinct and distinct



Pic. 2. *Catanthera paniculata*, (Nayar) Nayar (Based on Carr 14189). A. Plant - actual size; B. Large stamen, Ventral view x 4; C. Large stamen, dorsal view x 4; D. Small stamen x 4.



on the lower surface, coriaceous; petiole 1.2—2.5 cm long, stellate-plumose furfuraceous. Inflorescence axillary, paniculate, 9—12 cm long. Flowers tetramerous, pedicel 6—8 mm long, stellate plumose furfuraceous. Calyx tube obconic, 7 mm x 4 mm, stellate plumose furfuraceous, limb truncate. Petals oblong-ovate, 7—8 mm long. Stamens 8, 4 fertile and 4 sterile, fertile stamens: filament 4 mm long, anther ovate, 8 mm long, connective 2 mm long dorsally ends in a spur 1—1.5 mm long and ventrally ends in two subulate appendages 0.8 mm long. Sterile stamens: filament 1.5—2 mm long, anther 2.5 mm long, connective hardly produced, dorsally ends in a spur 0.5 mm long and ventrally ends in two subulate appendages 0.5 mm long. Ovary adnate to the calyx tube by 8 septa, extra-ovarial chambers 8, all descending to the base of the ovary; style 6—8 mm long, glabrous, stigma punctiform.

. DISTRIBUTION: Endemic to New Guinea.

NEW GUINEA: Alola, alt. 2000 m., 5 Jan. 1936, *Carr14189* (BM, K).

According to Carr's field notes the **flowers** are bright pink and the leaf petioles and nerves are brownish. *Catanthera paniculata* has fully developed paniculate inflorescence, characteristic ovate anthers for large stamens and lanceolate anthers for small stamens. *C. paniculata* differs from *C. ovata* in having ovate anthers for large stamens, **many** flowered paniculate inflorescence, larger (4—5 cm x 2.5—3 cm) 5-nerved leaves and longer petiole (12—25 mm long); whereas in *C. ovata* anthers of larger stamens are lanceolate, inflorescence is 3 flowered and leaves are smaller and 3-nerved (2—2.7 cm x 1.5—2.2 cm) and petiole is shorter (4—5 mm long),

## 2. CATANTHERA OVATA (Nayar) Nayar. — Fig. 3.

*Catanthera ovata* (Nayar) Nayar in Gard. Bull. Stngap. 24: 253. 1969. — *Hede7-ella ovata* Nayar HI Kew Bull. 20: 238. 1966. — Typus: New Guinea, *Brans 12726* (Violotype K).

Epiphytic climber. Branches angulate, stellate-furfuraceous. Leaves ovate, 2—2.7 cm X 1.5—2.2 cm, base rotundate, apex acute, upper surface glaucous, under surface stellate furfuraceous, 3-nerved, cross-venules absent or indistinct, coriaceous; petiole 4—5 mm long, stellate-furfuraceous. Inflorescence, axillary 2.5—3.5 cm long, stellate-furfuraceous, 3-flowered, peduncle 0.8—1 cm long. Flowers tetramerous; pedicel 0.8—1 cm long, stellate-furfuraceous. Calyx tube obconic, 7 mm long, apex dilate, stellate-furfuraceous, limb truncate. Petals oblong-ovate, 8—9 mm long, deep rose. Stamens 8, unequal, 4 fertile and 4 sterile. Fertile stamen: filament 3—3.5 mm long, anther lanceolate, 4—5 mm long, connective produced at the base 1.5—2 mm long, dorsally ends in

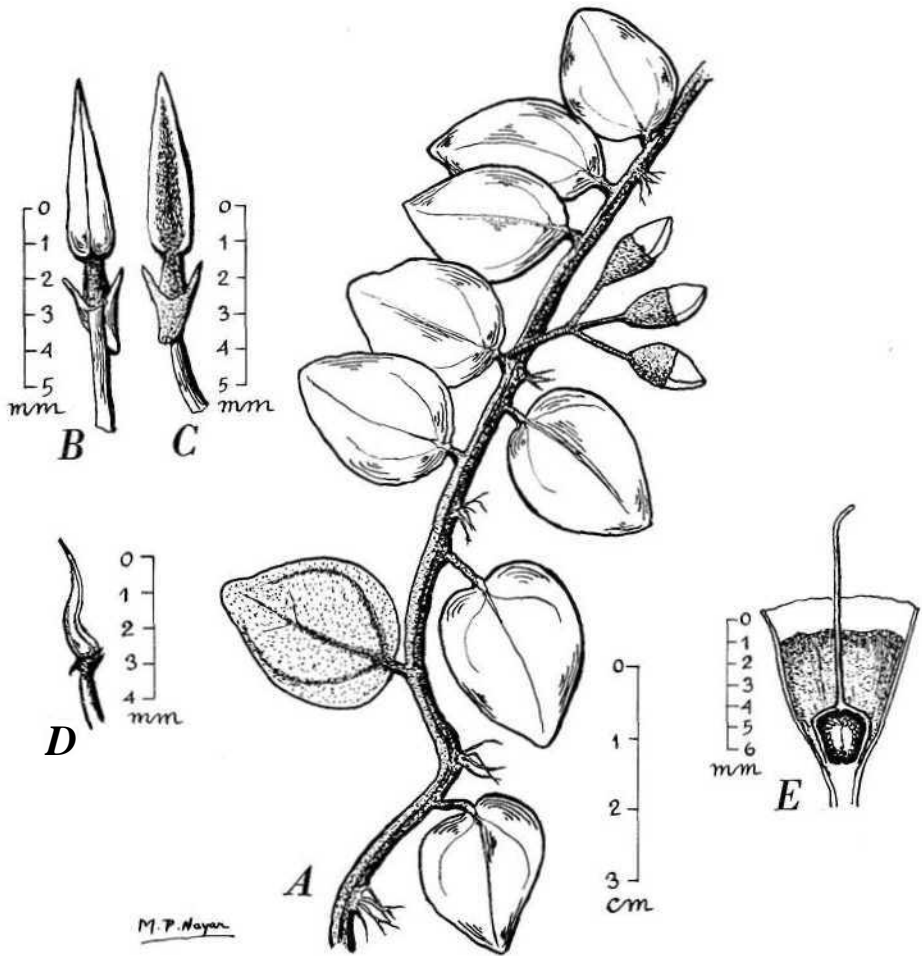


FIG. 3. *Catanthera ovata* (Nayar) Nayar (Based on Brass; 12726). A. Plant - actual size; B. Large stamen, ventral view x 5; C. Large stamen, dorsal view x 5; D. Small stamen x 5; E. L.S. of calyx tube x 3.

a spur 1.5 mm long and ventrally ends in two subulate appendages 1.2 mm long. Sterile stamen: filament 2 mm long, anther 3 mm long, connective not produced, dorsally ends in a spur 0.5 mm long and ventrally ends in two subulate appendages 0.7 mm long. Ovary adnate to the calyx tube by 8 septa, extra-ovarial chambers 8 descending beyond the middle of the ovary.

DISTRIBUTION: Endemic to New Guinea.

NEW GUINEA: West New Guinea: Idenburg river, Eernhard Camp, alt. 1600 M, Feb. 1939, Brass 12736 (K).

*Catanthera ovata* is immediately recognisable by 3-veined leaves with rounded base and obtuse apex and very short petiole (4—5 mm long) and by the characteristic stamens. This species closely resembles *C. brasii* but differs in having characteristic ovate leaves with obtuse apex, a shorter peduncle to the inflorescence (8—10 mm long); whereas in *C. brasii* the leaves are elliptic-ovate with acuminate apex and the peduncle is longer (2.5—2.3 cm long).

### 3. CATANTHERA QUINTUPLINERVIS (Cogn.) Nayar.

*Catanthera quintuplinervis* (Cogn.) Nayar in Gard. Bull. Singap. 24: 353. 1969. — *Dissockaeta quintiplinervis* Cogn. in DC, Monogr. Phan. 7: 556. 1891. — *HedereUa qñntuplinervis* (Cogn.) Stapf. in Hook. f. Ic. PL 25: t. 2416. 1895; Merrill in Journ. Str. Br. Roy. As. Soc. 1921. Spec. No.: 446. 1921; Nayar in Kew Bull. 20: 236, 1966. — Typus: Borneo, *Beccari 1802* & *S37i* (isosyntyp K).

Epiphytic climber. Branches densely ferrugineo-plumoso-setose. Leaves elliptic-ovate or ovate, 5—7.5 cm X 3—5 cm, base rounded, apex briefly acuminate, upper surface glabrous between the nerves and pubescent along the nerves, lower surface plumose setose, pubescence deciduous, 5-nerved, transverse nerves not conspicuous, coriaceous; petiole 2.5—3 cm long, densely plumose-setose. Inflorescence: flowers solitary, axillary, densely plumose setose; bracteole subulate 1.5 mm long; pedicel 4—5 mm long. Calyx tube obconic, 7—8 mm long, densely plumose setose, ferrugineous, limb truncate or sinuate. Petals 4, ovate 9—10.5 mm long, fleshy. Stamens 8, unequal; larger stamen with filament 4—5 mm long, anther lanceolate 5.5—6 mm long, connective long produced 2 mm long, anther dorsally minutely calcarate, ventrally ending in two subulate appendages; smaller stamen with filament 4—4.5 mm long, anther linear-lanceolate, 3.5 mm long, connective briefly produced or not (0.2 mm long), dorsally ending in a minute tubercle and ventrally ending in two tubercles. Ovary crescent with the calyx tube by 8 septa, extra-ovarial chambers 8 all descending to the base of the ovary; apex of the ovary furfuraceous. Style 13—14 mm long, glabrous, stigma inconspicuous.

DISTRIBUTION: Liana in primary forests. Sumatra and Borneo.

SUMATRA: Central Sumatra: Indragiri uplands: Muara Padjanki, 9 Apr. 1939, *Buwalda 6451* (K); *Ibid.*, alt. few m., 6 Apr. 1930, *Buwalda 6388* (K).

BORNEO. Sarawak: Matang, *Haviland 153* (K, BM); sine loc. *Beccari 1803* & *SS7i* (K); sine loc. *Native collector BSN 2468* (K),

*C. quintuplinervis* is closely allied to *C. schleckeri*, a species endemic to New Guinea, in the nature of leaves and in the presence of solitary flowers. However in *C. schleckeri* the calyx limb is distinctly lobed

and the large stamens are widely lanceolate; whereas in *C. quintuplinervis* the calyx limb is truncate or sinuate and the large stamens narrowly lanceolate.

Hitherto *C. quintuplinervis* has been recorded from Borneo and *Buwalda 6451* and *Buwalda 6383* from Central Sumatra represent an extension of its range and new record for Sumatra.

#### 4. *Catanthera pilosa* Nayar, *spec. nov.* — Fig. 4.

Frutex epiphyticus. Eami angulati, penduli, juniores dense pinnato-pilosi. Folia ovata, 3 - 4,5 cm X 2 - 3.5 cm, basi subcorclata vel rotundata, Epice aeuta, supra glauca vel statu juniore decidue stellulata, Bubtus dense stellulata et pinnato-pilosa, 5-nervia, supra venulis transversis haud conspieuis, .subtus venulis transversis distinctis, coriacea; petiolns 10—15 mm longus, dense stellatus et pinnato-pilosus. Inflovescentia axillaris, 5—7 cm longa, 3—5 flora; pedunculus dense stellatus et pinnato-pilosus. Flores tetrameri; pedicellus 4—5 mm longus, dense stellulatus et pinnato-pilosus, Calycis tabus campanulatus, 8—9 mm longus, stellato-pinnato-pilosus, limbo truncate Petala 4, ovato-oblonga, 7—7.5 mm x *i*—4.5 mm longis. Stamina 8, subequalia, maionim filamentis 3.5—4 mm longis, basi pilosis, antheris nblongis 7 mm longis, 1-poris, connectivo basi produneto 0.5—0.8 mm longo dorso in calcar 1—1.3 mm loijugum exeunte, in parte ventrali in appendices duas lineares 2.5 mm longas exeunte; minorum filamentis 3—3.5 m mlongis, basi pilosis, antheris 6.5 mm longis, connectivo basi haud produeto, dorso in calcar 0.4—0.6 mm longum exeunte, in parte ventrali in appendices duas lineares 1.5 mm longas exeunte. Ovarium ealycis tubo septis 8 adnatum, loculi 8 ultra dimidium ovarii descendentes, apice pilosum. Stylus 8—10 mm longus, basi furfuraceus, apice incrassatus, glabsr, stigmatē haud conspicuo.

TYPUS: Borneo, *G. Mikil 38601* (holotype K).

DISTRIBUTION: Endemic to Borneo.

BORNEO. Sabah: Kinabalu, sosopodon near KundasanR, alt. c. 1333 m. 17 Aug. 1963, *G. Mikil 58G01* (K).

*C. pilosa* is allied to *C. endertii* in the shape and pubescence of leaves. However this species differs from *C. endertii* in having larger calyx tube (8-9 mm long) with truncate limb and larger inflorescence (5-7 cm) long and 5-nerved leaves; whereas *C. endertii* has 4 dentate smaller calyx tube (5-7 mm long) and smaller inflorescence (3-3.5 cm long) and 7-nerved leaves.

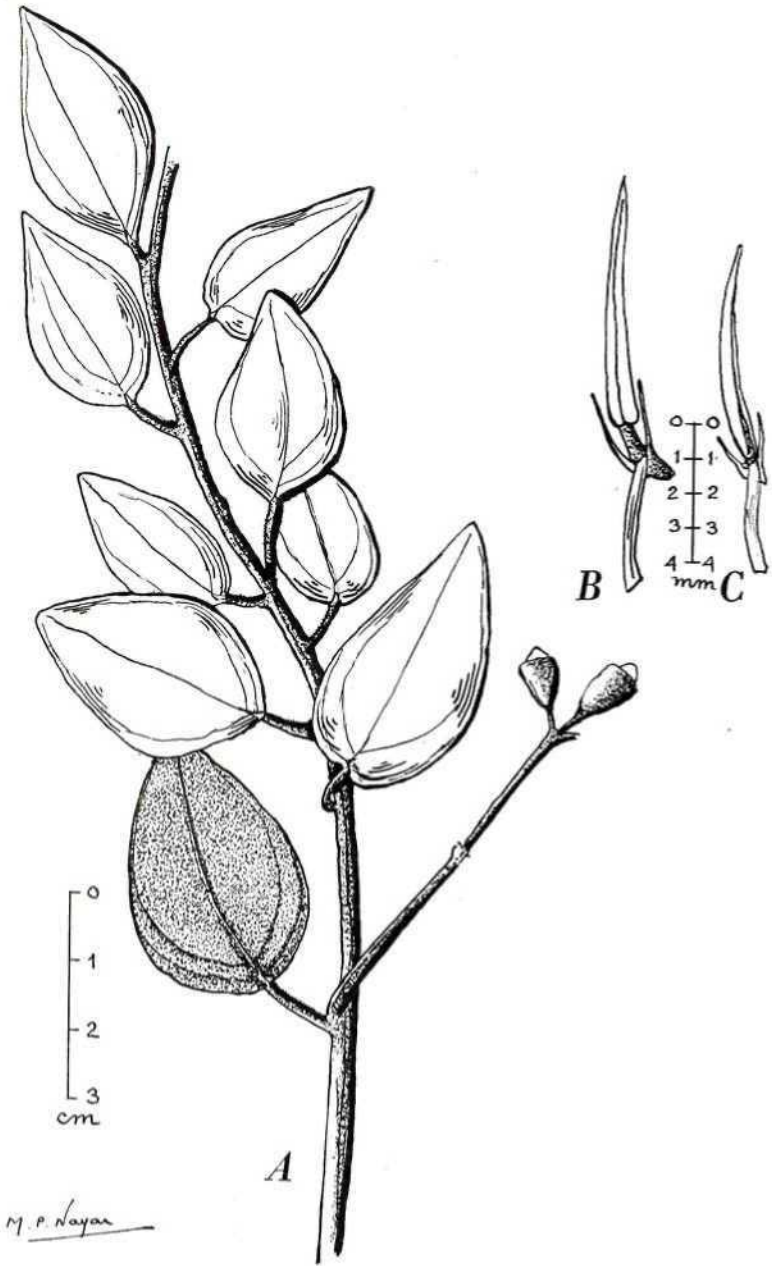


FIG. 4. *Catanthera pilosa* Nayar (Based on Mikil 38601), A. Plant . actual size ; B. Large stamen x 5; C, Small stamen x 5.

5. *Catanthera novoguineensis* Nayar, *spec. nov.* — Fig. 5.

Frutex epiphyticus. Kami **angulati, juniorea** ferrugineo-stellato-furfuracei. Folia ovata, 2.5—7 cm X 2.3—6 cm, basi subeortlata ov rotundata, apice acuta, supra glabra, subtus sparse stellato-i-urfuracea, 5-nervia, ventilis hand conspicuis, coriacea; petiolus 15-25 mm longus, dense ferrngijieo-stellato-furfui-acews. **Inflorescentia axillaris, 5 - 7.5 cm longa**, umbelliformis, 5—8 flora; pedunculus 3—3.5 cm longus, dense ferrugineo-stellato-furfuraceus; pedicellus 1—2 em longus, ferrugmeo-stellato-furfuraceus. Calycis tubus obconicus, 6—6.5 mm longus, apicc diktatus, dense stelhilato-furfuraceus, limbo **truncate**. Petala 4, ovata, 9.6—10.5 mm x 6.5—7 mm. Stamina 8, inalqualia, 4 fertilia ei 4 sterilia,

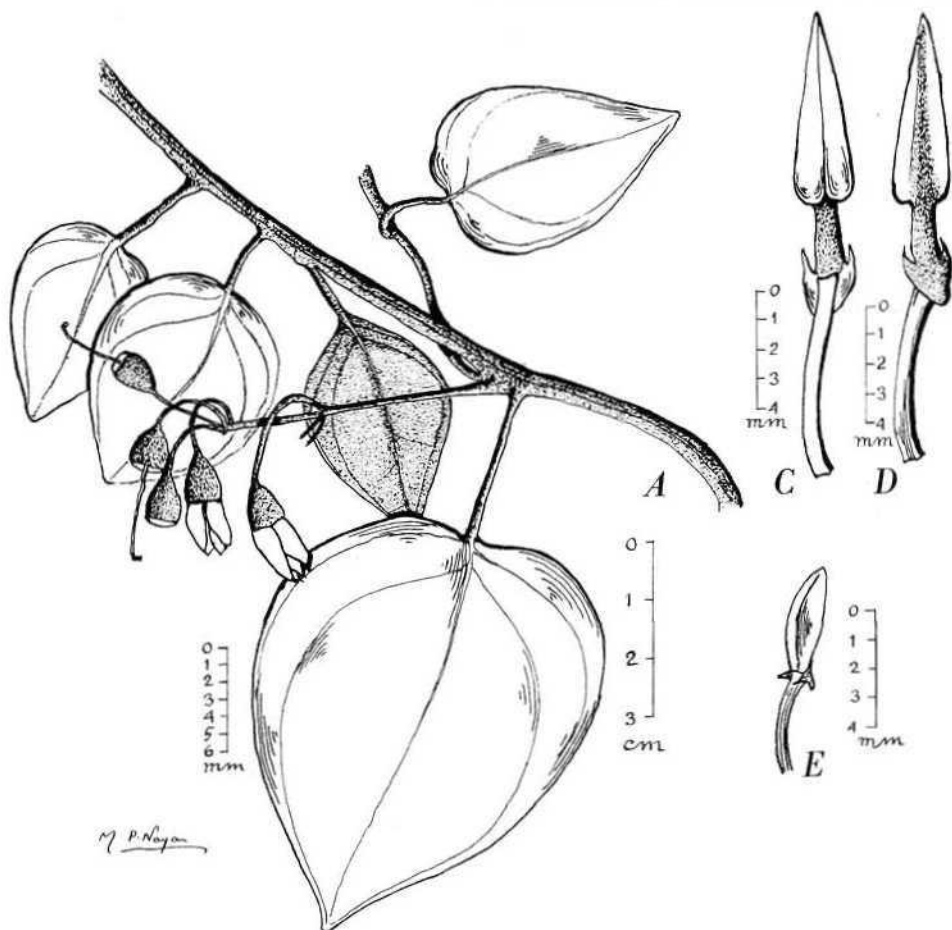


FIG. 5. *Catanthera novoguineensis* Nayar (Based on Womersley & Millar NGF 8340). A. Plant- actual size; B. Petal x 3; C. Large stamen, ventral view x 5; D), Large stamen, dorsal view x 5; E. Small stamen x 5.

**maiorum** filamentis 7 mm longis, antheris late lanceolatis 5.5 mm longis 2—2.5 mm latis, 1-poris, connectivo basi producto 2.8 mm longo dorso in ealcar 0.5—0.8 mm longum exeunte; minorum filamentis 4 mm longis, antheris oblongo-lanceolatis 3—3.5 mm longis, connectivo haud producto, dorso in ealcar 0.6—0.8 mm longum exeunte, in parte **ventrali** in appendices duas **snbulatas** 0.6—0.8 mm longas exeunte. Ovarium calycis tubo septis 8 adnatum, loculi 8, ultra dimidium ovarii descendentes, apice glabrum. Stylus 20—22 mm longus, glaber, stigmatibus punctiformi.

TYPUS: New Guinea, **Womersley & Millar NGF 8340** (holotype K, isotype BM).

DISTRIBUTION: Endemic to New Guinea; a climber on trees of evergreen forests.

NEW GUINEA. Territory of New Guinea: Mo robs District, Wau-Salamaua road, near Skindewai, alt. 1800 m, 5 Jan. 1956, **Womersley & Millar NGF 8340** (K. BM).

In the nature of stamens and the shape of leaves *C. novoguineensis* is closely allied to *C. ovata*. But in *C. novoguineensis* the inflorescence is 5—8 flowered, longer pedunculate (3—3.5 mm long) and the leaves are larger (2.5—7 cm X 2.3—6 cm) and longer petiolate (15—25 mm long); whereas in *C. ovata* the inflorescence is about 3 flowered, shorter pedunculate (0.8—1 cm long) and the leaves are smaller (2—2.7 cm X 1.5—2.2 cm) and shorter petiolate (4—5 mm long).

## 6. CATANTHERA BRASSII (Nayar) Nayar. — Fig. 6.

*Catanthera brassii* (Nayar) Nayar in Gard. Bull. Singap. 24: 353. 1960. — *HedereRa brassii* Nayar in Kew Bull. 20: 238. 1966. — Typus: New Guinea, **Brass 7044** (holotype K, isotype BM).

Epiphytic climber. Branches angular ferrugineous, stellate-furfuraceous. Leaves opposite, elliptic-ovate, 3.5—5.5 cm x 2—3 cm, base obtuse or sub-cuneate, apex acuminate, upper surface when young stellate-furfuraceous, and later on glaucous, under surface densely ferrugineous, stellate-furfuraceous, 5-nerved, cross-venules indistinct, coriaceous; petiole 1—1.5 cm long, densely stellate-plumose furfuraceous. Inflorescence axillary, 3.5—4.5 cm long, umbelliform, densely stellate plumose furfuraceous; peduncle 2.5 cm long. Flowers 4-merous; pedicel 9—12 mm long, densely stellate plumose furfuraceous. Calyx tube obconic, 6 mm long, apex dilate, ferrugineous, stellate furfuraceous, limb truncate. Stamens 8, unequal, 4 fertile and 4 sterile. Fertile stamen: filament 2—2.5 mm long, anther lanceolate 6—7 mm long, connective produced at the base 1 mm long, dorsally ends in a spur 1 mm long, ventrally ends in two subulate appendages 1 mm long. Sterile stamen: filament 2 mm long, anther 3 mm long, connective dorsally ends in a spur 0.7 mm long and ventrally

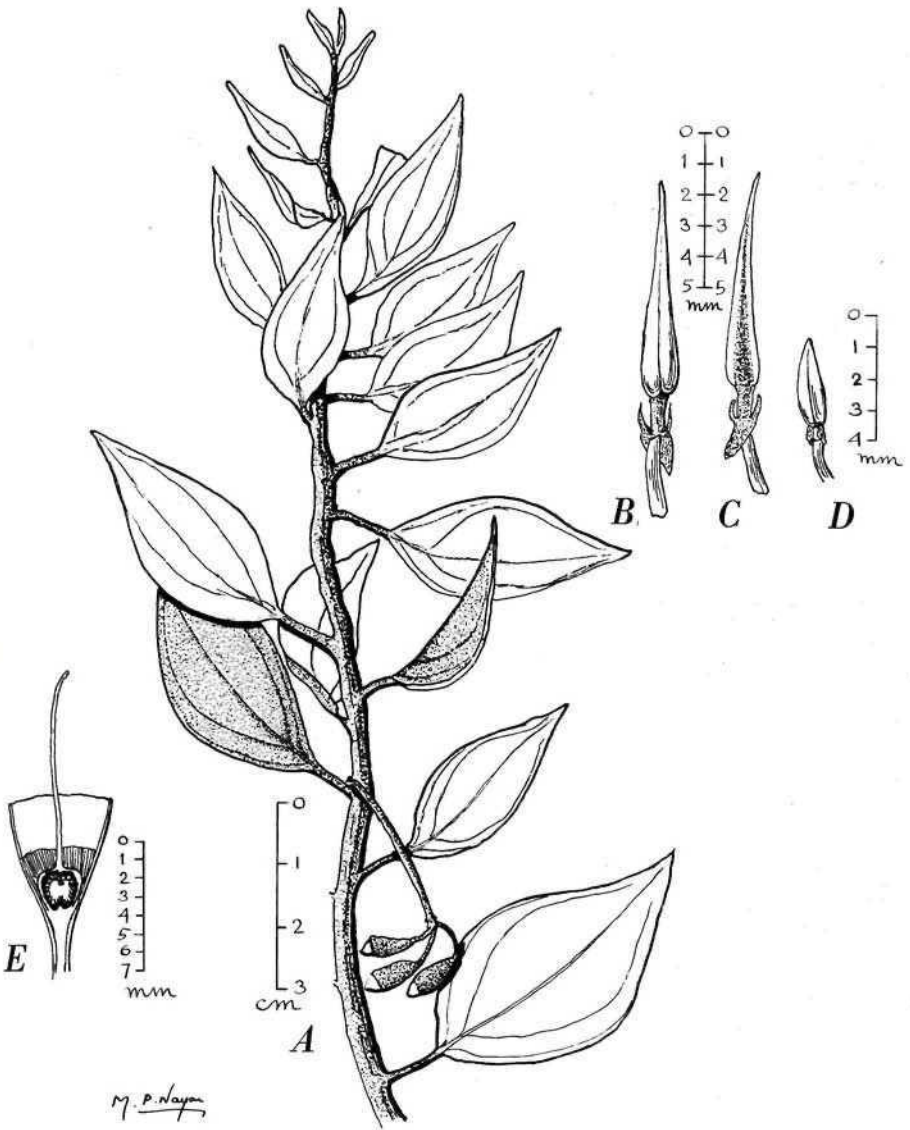


FIG. 6. *Catanthera brasii* (Kayar) Nayar. {Based on Brass 7044}. A, Plant - actual size; B, Large stamen, ventral view x 5; C, Large stamen, dorsal view x 5; D, Small stamen, ventral view x 5; E, L.S. of calyx tube x 3.



ends in two subulate appendages 0.8 mm long. Ovary adnate to the calyx tube by 8 septa, extraovarial chambers 8, descending beyond the middle of the ovary; style 7-8 mm long, glabrous, stigma punctiform.

DISTRIBUTION: An epiphytic climber with pink flowers in low land rain forests of New Guinea. The species forms a canopy in the crown of very tall trees with many pendant slender branches.

NEW GUINEA. Territory of New Guinea: Palmer river, alt, 100 m., June 1936. *Brass* 7044(K, BM).

*Catanthera brassii* is allied to *C. kinabaluensis* but differs in the shape of the anthers, petals, calyx tube and in the venation of leaves. In *C. brassii* the larger anthers are lanceolate, the petals are ovate-oblong (7—8 mm X 5 mm), the calyx tube is dilated (6—7 mm long) and the leaf 5-veined; whereas in *C. kinabaluensis* the larger anthers are oblong, the petals are lanceolate (9 mm x 2.5 mm) the calyx tube is not dilated (4.5 mm long) and the leaf 3-veined.

#### 7. *Catanthera royenii* Nayar, spec. nov. — Fig. 7.

Frutex epiphyticus. Rami angulati, juniores dense ferrug-ineo-pinnato-pilosi. Folia ovata 5—9 cm x 3.5—6 cm basi rotundata vel subcordata, apice breviter acuminata, supra glauca, subtus iimiores stellato furfuracea et sparse, pinnato-puberula, 5-nervia, venulis transversis haud conspicuis, supra siccitate viridia, subtus siccitate pallida, coriacea; petiolus 1—2.5 cm longus, dense ferrugineo-stellato-furfuraceus et pinnato-pilosus. Inflorescentia axillaris, umbelliformis, 7—10 cm longa, 5—12 flora; pedunculus dense ferrugineo-stellato-furfuraceus et pinnato-pilosus, 4.5—6 cm longus; bractee lineares 5—6 mm x 0.8 mm, furfuraceae; pedicellus 20—30 mm longus, dense stellato-furfuraceus et pinnato-pilosus. Calycis tubus obconicus 6—7 mm x 4.5—5.5 mm, ferrugineus, furfuraceus, limbo truncato. Petala 4, ovata, 6—7 x 4.5—5.5 mm. Stamina 8, inaequalia, maiorum filamentis 3 mm longis, antheris oblongo-lanceolatis 6 - 6.5 mm longis, connectivo basi haud producto, dorso in calcar 1.5 mm longum exeunte, in parte ventrali in appendices duas subulatas 0.5 mm longas exeunte, minorum filamentis 2.5 mm longis, antheris 4 mm longis, connectivo non producto, dorso in calcar 1 mm longum exeunte, in parte ventrali inappendiculato. Ovarium calycis tubo septis 8 adnatum, loculi 8, ultra dimidium ovarii descendentes, apice glabrum. Stylus filiformis, 7—8.5 mm longus, stigmatibus punctiformi.

TYPUS: New Guinea, *van Royen & Sleumer* 7405 (holotype K, isotype L).

DISTRIBUTION: A climber of *Nothofagus* forests of New Guinea with flowers having orange brown calyx tube and yellowish petals. Endemic.

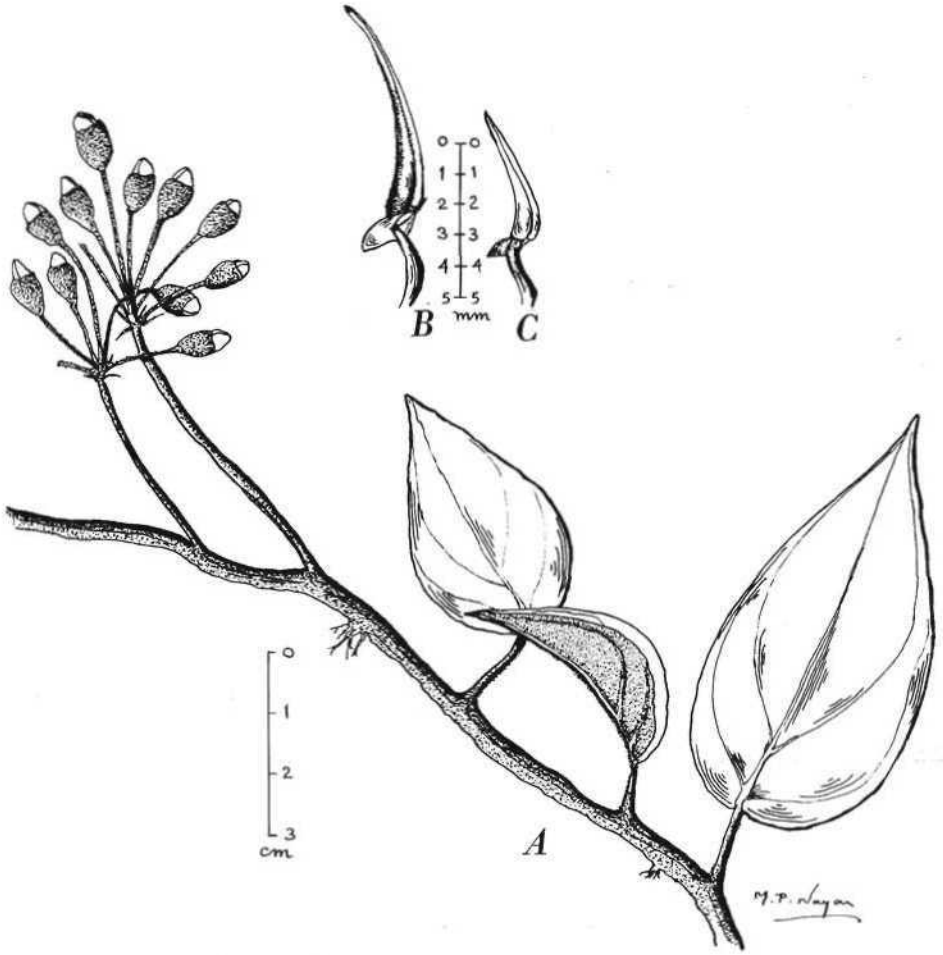


FIG. 7. *Catanthera royenii* Nayar (Based on van Royen & Sleumer 74051). A. Plant actual size; B. Large stamen x 5; C. Small stamen x 5.

NEW GUINEA. West New Guinea: Vogelkop, Nettoti Range, southern slope, silt, 1780 in, 28 Nov. 1961, van Royen, & Sleumer 7405 (K, L).

*Catanthera royenii* is allied to *C. multiflora* in the shape and in the venation of leaves and in the long-pedunculate many flowered umbellate inflorescence. However *C. royenii* is easily distinguishable by its ferruginous stellate-furfuraceous and pinnate pubescence; whereas in *C. multiflora*, branches, leaves and inflorescence are glabrate. *C. multiflora* is endemic to Borneo and *C. royenii* is endemic to New Guinea.

## 8. CATANTHERA LONGISTYLIS (Mansf.) Nayar.

*Catanthera longistylis* (Mansf.) Nayar in Gards. Bull. Singap. 24: 353. 1969. — *Medinilla longistylis* Mansf. in Engl. Bot. Jahrb. 60: 113. 192ā. — *Hederella longistylis* (Mansf.) Nayar in Kew Bull. 20:238. 1966. — Typus: New Guinea, *Schlechter 19255* (isotype K).

Scandent. Branches angulate, young branches sparsely furfuraceous, verrucose. Leaves elliptic 3.4—6 cm x 1.5—3.5 cm, base subrotund or acute, apex subrotund, lower surface glabrous, under surface minutely verrucose, 3—5 nerved, cross-venules absent; petiole 1—2 cm long. Inflorescence subpanicle and umbelliform, 6—8 cm long, glabrate, pedicel 2—3 cm long. Calyx tube obconic, 4.5 mm long, glabrous, limb dilated and truncate. Petals 4, 11—12 mm long. Stamens 8, prominently unequal, anther long 10 mm long, dorsally calcarate and ventrally ends in two subulate appendages, small stamens; 5 mm long. Style 15—20 mm long, stigma inconspicuous. Ovary concrescent with the calyx tube by 8 septa, extra-ovarial chambers 8, all descending to the base of the ovary.

DISTRIBUTION: Endemic to New Guinea.

NEW GUINEA. Papua: alt. 300 m, 16 Apr. 1909, *Schlechter 19258* (isotype K): New Guinea: Morobe Dist., 26 Dec. 1935, *Clemens 1379* (L.)

*Catantkera longistylis* is immediately recognised by its elliptic leaves with glabrous upper surface and verrucose under surface, compound umbelliform inflorescence and prominent long style (2 cm long).

## 9. CATANTHERA LYSIPETALA F.V. Muell.

*Catanthera lysipetala* F.v. Muell. in Journ. Bot. 24: 289. 1886; Nayar in Gards. **Biril Singap. 24:852.1969** — *Hederella lysipetala* (P.v. Muell.) Nayar in New Bull. 20: 237. 1966. — Typus: New Guinea, *Forbes 419* (lectotype BM, isotype CAL).

*Medinilla anomala* Cogn. in DC. Monogr. Phan. 7: 1185. 1891. — Typus: New Guinea, *Forbes 451* (holotype BM, isotypes K, CAL),

*Hederella forbesii* Stapf in Hook. f., Ie. Pl. 25: t. 2415. 1895. — Typus: New Guinea, *Forbes 451* (holotype K).

Epiphytic climber. Branches angulate, young branches densely ferrugineo-plumoso-pilose, older branches verrucose and grooved. Leaves rotundate-elliptic or elliptic-ovate, 5—7.5 cm x 3.5—5.5 cm, base rounded, apex obtuse, upper surface glabrous, under surface ferrugineo-plumose pilose when young, pubescence deciduous and undersurface of leaf glabrous when old, 7-nerved, cross-venules absent, coriaceous; petiole 1.5—2 cm long, ferrugineo-plumose pilose. Inflorescence axillary, umbellate, puberulous; peduncle short 0.5—1.5 cm long; pedicel 2—2.8 cm long. Calyx tube carapanulate, 5.5—6 mm long, minutely puberulous, limb dilated. Petals

4, oblong 10—11 mm long. Stamens 8, prominently unequal; large stamens: filament 5—5.5 mm long, anther oblong 8—8.5 mm long, connective long produced 2.5 mm long, dorsally ending in a triangular appendage 1 mm long, ventrally ending in two oblong lobes 1—1.2 mm long; small stamens: filament 2.5—3 mm long<sup>1</sup>, anther broadly oblong, 4.5 mm long, **connective** not produced, dorsally ending in a short spur, 0.5 mm long, ventrally ending in two subulate appendages 0.8 mm long. Ovary crescent with the calyx tube by eight septa, extra-ovarial chambers 8, all descending to the base of the ovary. Style filiform, 15—17 mm long, **glabrous**, stigma inconspicuous.

DISTRIBUTION: Endemic to New Guinea.

NEW GUINEA. Papua: Sogen<sup>1</sup> region, Forbes 473 (BM, CAD; Ibid., Forbes 451 (K, BM, CAL).

F.v. Mueller (1889) erected the type species *Catantkera lysipelala* on the basis of syntypes Forbes 419 and Forbes 151 from New Guinea. Cogniaux (1891) independently described *Mediniua anomala* on the basis of specimen Forbes 451. In 1895 Stapf described the genus *Hederella* for the homogenous group of species i.e. *Hederella multiflora* Stapf. *H. tetrandra* Stapf. *H. quintuplinervis* (Cogn.) Stapf and *H. forbesii* Stapf. Stapf's *H. forbesii* is based on the same type specimen Forbes on the basis of which Mueller (1889) **erected** a new genus *Catantkera* and Cogniaux (1891) proposed a new species of *Medinilla*. **Mansfeld** (1925) appropriately reduced Cogniaux's *Mediniua-anomala* and Stapf's *Hederella forbesii* to synonyms of *Catantkera lysipetala* F.v. **Mueller** and effected the new combination *Mediniua lysipetala*, (F.v. Muell.) Mansf.

#### 10. CATANTHEKA MULIIFLORA (Stapf) Nayar.

*Catanthera-multiflora* (Stapf) Nayar in Cards. Bull. Singap. 21: 352. 1069. — *Hederella multiflora* Stapf in Hock. f. Ic. Pl. 25: t. 2415. 1895; Merrill in Jourti. St. Br. Roy. As. Soc. 1021, Spec. No.: 446. 1921; Nayar in Kew Bull. 20: 233. 1966. — Typus: Borneo, *Ilaviland 154* (holotype K, isotype BM).

*Medinilla multiflora* (Stapf.) Mansf. in Engl. Bot. Jahrb. GO: 124. 1926.

Epiphytic climber. "Branches glabrous, **angular**, Leaves opposite, equal, ovate 7—9 cm x 4—4.5 cm, base rotundate or subcordate, apex **acuminate**, **upper** and lower surface glabrous, 3—5-nerved, two, side nerves near the margin not conspicuous, cross-venules indistinct, coriaceous; petiole 2.5—4 cm long. Inflorescence axillary, urn belli form glabrous; peduncle 4—5.5 cm long with 8 to 12 flowers; podicel 1.5—2.5 mm long. Calyx tube ovoid, 4—5 mm long, glabrous, limb truncate. Petals contorted in bud, **lanceolate**, 8 mm long, rose (ex Collector). Stamens 8,

unequal; large stamen: filament 2.5 mm long, anther oblong, *b* mm long obtuse connective shortly produced 0.5 mm long, dorsally ending in a triangular appendage 1.5 mm long, ventrally ending in two subulate appendages 1 mm long, small stamens: filament 2 mm long, anther oblong or clubshaped, 3 mm long, dorsally ending in a spur 1.5 mm long, ventrally ending in two subulate appendages 0.8 mm long. **Ovary** tor crescent with the calyx tube by 8 septa, extra-ovarial **chambers** 8, ascending to the base of the ovary, apex of the ovary glabrous. Styl filiform, 9—11 mm long, glabrous, stigma inconspicuous.

**DISTRIBUTION:** A climber with sucker roots in lowland evergreen forests of Borneo; endemic to Borneo.

**BORNEO:** Sarawak: Matang, alt. 533 m, *Haviland 151* (K, BM); I "doonesian Borneo: Peak of Ealikipapan, Sembuni, alt. 650 m, **Oct. 1953, Kottl mans 7653** (K).

This is a glabrous epiphytic climber with pale purplish flowers.

#### 11. CATANTHERA KINABALUENSIS (Nayar) Nayar.

*Catanthera kinabahiensis* Nayar in Gard. Bull. Singap. 24: 353. **1969**, - *Hederrua kinabaluensis* Nayar in Kew Bull. 20: 237 1966. — **Typus:** Borneo, *R.S.N.B. No. 70* (Holotype K).

Epiphytic climber. Branches angular, ferruginous, stellate-furfuraceous. Leaves opposite, elliptic ovata, 3.5—4.5 cm x 1.5—2.5, base obtuse, apex acuminate, upper surface densely stellate-furfuraceous S-nerved, **cross-venulea** hardly conspicuous, coriaceous; petiole 7—10 mm long, densely stellate-plumose-furfuraceous. Inflorescence axillary, 25—4 cm long, densely stellate-plumose-furfuraceous, umbelliform, 3—12 flowers; pedicel 0.5—0.7 cm long. Calyx tube widely campanulate 4—5 mm long, limb truncate. Petals ovate-oblong or ovate, 8—9 mm long. Stamens 8, unequal; large stamen: filament 4.5 mm long, anther oblong 4.5 mm long, connective produced at the base 0.5 mm long, dorsally ends in a spur 1—1.5 mm long, ventrally ends in two subulate appendages 1.5 mm long; small stamen: filament 4 mm long, anther 2.5—3 mm long, connective ends in an appendage 2 mm long, ventrally ends in two linear appendages 2—2.5 mm long. Ovary adnate to the calyx tube by 8 septa, the extra-ovarial chambers 8 descending beyond the middle of the ovary: style filiform 10—11 mm long, glabrous, stigma punctiform.

**DISTRIBUTION:** A liana of 25 m in height, growing in tropical rain forests of Borneo. This forms a canopy in the forests and the branches hang down in bunches from trunks of host. Endemic.

**BORNEO.** Sabah: Mt. Kinabalu, eastern shoulder, alt. 1833 m, **IS Jim. 1961, R.S.N.B. No. 76** (K); Penibukan, W. ridge, alt. 1666 m, 4 Oct. 19; W, J. & MS *Clemens 40562* (K, BM, I.); *Ibid.*, alt. 1833 m, **13 NOV. 1933, J. & M.S. Clemens 50343**

(K, BM, L); *ibid.*, alt. 1333 m, 15 Feb. 1933, *J. & M.S. Clemens 5159S* (K, BM), Indonesian Borneo: W. kutai, near Mt. Kemoel, alt. 1100 m, 10 Oct. 1925, *Endert 38(17)* (K); *Ibid.*, alt. c. 1200 m, 27 Sept. 1925, *Endert 3G08* (K).

*C. kinabaluensis* is related to *C. brassii* Nayar and from which it differs in the shape of the anthers and in the venation of leaves. In *C. kinabaluensis* the anther of large stamens is oblong and the leaf is 3-nerved, whereas in *C. brassii* the anther of large stamens is lanceolate and the leaf is 5-nerved. Heine (*in* Inaug. Dissert, Doktor Lud.-Maximilliaii Univer. 78 (1953)) referred the specimen *J. & M.S. Clemens 31598 & 40562* erroneously to *C. tetrandra* (Stapf) Nayar (= *Hederella tetrandra* Stapf). According to *J. & M.S. Clemens* field notes (specimens *J. & M.S. Clemens 50343*) this is a most spectacular climber, drooping in long garlands from trees,

## 12. CATANTHERA TETRANDBRA (Stapf) Nayar

*Catanthera tetrandra*, (Stapf) Nayar *in* Gard. Bull. Singap. 24: 353. 1969 — *Hvderella tetrandra* Stapf *in* Hook. f. Ic. Pl. 25: t. 2415, 1895; Merrill *in* Journ. Str. Ik. A?. Soc. Spec. No.: 446. 1921; Nayar *in* Kew Bull. 20: 237. 19G6. — Typus: Borneo. *P.eccar!* 30% (isotype K).

Epiphytic climber. Branches young branches ferrugineo-furfuraceous, glabrous when old, striate or corticated. Leaves rotundate-ovate or elliptic-ovate, 4.5—8 cm X 3—4cm, base rounded or subcordate, apex briefly acuminate, glabrous, 5-nerved, cross-venules distinct, coriaceous; petiole 2—4 mm long. Inflorescence axillary, umbellate, 3—8 flowers, minutely furfuraceous; peduncle 1—5.5 cm long; bracteole linear 3—4.5 mm long; pedicel 1.5—1.9 cm long, furfuraceous. Calyx tube obconic 7—8 mm long, minutely furfuraceous, limb truncate. Petals 4, oblong, 10—11 mm X 4—4.5 mm, distinctly veined, apex acuminate. Stamens 4, equal filament 6 mm long, anther lanceolate 10—11 mm long, connective hardly produced, dorsally ending in a triangular appendage 1.5—1.8 mm long, ventrally ending in two subulate appendages 2—2.5 mm long. Ovary crescent with the calyx tube by 4 septa, extra-ovarial chambers 4, all descending to the base of the ovary, apex of the ovary minutely furfuraceous or glabrate. Style 11—12 mm long, minutely puberulous, stigma not conspicuous.

DISTRIBUTION: A climber with leathery leaves in evergreen rain forests of Borneo. Endemic.

BORNEO. Sarawak; Near Kuching, 29 Nov. 1894, *Haviland & Wose 3389* (K, BM, L); Baram Dist., Nov. 1891, *Hose 51* (K, BM); Niah, May 1892, *Haviland & Hose 3223* (K) sine loc. *Deccari 304* (K); Sabah: Mt. Kinabalu, Pinosuk Plateau, alt. 1833 m, 20 Aug. 1961, *R.S.N.B. No. 1326* (K).

*C. tetrandra* (Stapf) Nayar is easily distinguishable by the presence of four equal fertile stamens, whereas all other species of *Catanthera* have eight stamens.

### 13. *Catanthera peltata* Nayar *spec. nov.*

Frutex ejDiphyticus. Rami dense plumoso-pilosi. Folia peltata, ovata, 17 cm longa, 9 cm lata, basi rotundata, apice aeuminata margine integra, supra glabra, subtus ad nerves dense plumoso-pilosa, inter nerves sparse plumoso-piloso, 7—9 nervis supra et subtus venulis transversis distinctis; petiolus 3.5 cm longus, dense plumoso-pilosus. Inflorescentia axillaris, c, 7 cm longa, pseudoumbellata, dense plumoso-pilosa; pedunculus 4—5 cm longus; bracteolae lineares 3 mm longae, dense plumoso-pilosae; pedicellus 5—7 mm longus. Calyeis tubus campanulatus, 6—6.5 mm long-us, dense plumoso-setosus, limbo truncate Petala late ovata, 3.5—4 mm x 3.5—3.8 mm. Stamina 8, subequalia, filamentis 3—3.5 mm longis, antheris oblongis 4.5—6 mm longis, connectivo basi 0.4 mm producto, dorso in calcar 0.3 mm longum exeunte, in parte ventrali in appendices duas subulatas 1 mm longas exeunte, Ovarium calycis tubo aeptis 8 adnatum, loculi 8, ultra dimidium ovarii descendentes, apite plumoso-pilosum. Bacca subglobosa 7—9 mm X 6—8 mm, dense plumoso-pilosa. Ssmina cuneata, numerosa, 0.6—0.8 mm longa.

TYPUS: Sarawak, *Haviland b.g.v.a. 182* (K.)

DISTKIBUTION : Endemic to Borneo.

BORNEO. Sarawak: Sarawak river, Trusan, *Haviland b.g.v.a. 182* (K.).

As the specific epithet indicates this species is readily distinguishable from other known species of *Catanthera* by its peltate leaves.

### 14. CATANTHERA ENDEETII (Nayar) Nayar.

*Catanthera enderMi* (Nayar) Nayar in Gards, Bull. Singap. 24: 353. 1969. — *Hederella enderfii* Nayar in) Kew Bull. 20: 240. 1966. — Typus: Borneo, *Evdert 439:/* (holotype K).

Epiphytic climber, densely ferruginous and stellate furfuraceous. Leaves ovate, 4.5—5.5 cm x 3—4 cm, base cordate, apex acute, upper-surface glaucous, when young stellate furfuraceous, under surface densely stellate plumose furfuraceous, 7-nerved, cross-venules distinct, coriaceous; petiole 1.7—2.7 cm long, stellate plumose furfuraceous. Inflorescence axillary, 3—3.5 cm long, umbellate, densely stellate plumose furfuraceous. Flowers not seen. Calyx tube ovoid, 5—7 mm long, stellate plumose furfuraceous, 4-dentate, lobes 1—1.5 mm long. Ovary adnate to the calyx tube by 8 septa, extra-ovarial chambers descend to the base of the ovary.

DISTRIBUTION: Endemic to Borneo.

BORNEO. Indonesian Borneo: Mt. Kemoel, W. Kutai, alt. 1850 m., 20 Oct. 1925, *Erulert* 4390 (K).

*Catanthera endertii* is immediately recognised by its 4 dentate calyx tube (5—7 mm long-) and by its 7-nerved stellate-ferrugineous ovate-cordate leaves (4.5—5.4 cm x 3—4 cm), *C. endertii* is allied to *C. pilosa* but differs in the presence of 4-dentate calyx tube and 7-nerved leaves.

15. *Catanthera sleumeri* Nayar, *spec. nov.* — Fig. 8.

Frutex epiphyticus. Kami angulati, juniores dense pinnato-pilosi. Folia ovata, 5—10.5 cm X 3.5—6.8 cm, basi subcordata vel rotundata, apice acummata, supra of subtus dense pilosa, 7-nervis, supra venulis transversis haud conspicuis, subtus nervis urominentibus, chartacea; petiolus 1.5—4 cm longus, dense pilosus. Flores axillares, solitari; pedunculus 4.5—5 cm longus, dense pilosus; bracteolae lineares 8—9 mm longae, dense pilosae; pedicellus 1.7—2 cm longus, dense pilosus. Calycis tubus obronicus 12—13 mm X 8—10 mm, dense pilosus; limbus 4-dentatus, dentibus anguste triangularibus, 7—7.5 mm longus, pilosus. Petals 4, ovata, 7.5—8.5 mm X 7 mm. Stamina 8, inaequalia, 4 fertilia et 4 sterilia; maorum filamantis 3—3.5 mm longis, antheris 7—8 mm longis 2-2.5 mm latis, late lanceolatis, connectivo basi producto 1 mm longo, dorso in calcarem triangularem 2.5 mm longum exeunte, in parte ventrali minute bituberculato; minorum filamentis 3 mm longis, antheris lanceolatis 5.5 mm longis, connectivo basi hand producto, dorso in calcar 2 mm longum exennte, in parte ventrali bituberculato. Ovarium calycis tubo stptis 8 adnatum, loculi 8, ultra dimidium ovarii descendentes, apice pilosum. Stylus 9—10 mm longus, basi pilosus, stigmatibus punctiformi.

TYPUS: New Guinea, *Van Royen & Sleumer* 7653 (K).

DISTRIBUTION: Endemic to New Guinea.

NEW GUINEA. West New Guinea: Vogelkup, ije river valley, near Benfot (Bamfot) village, alt. 900 m, 2 Nov. 1961, *van Royen & Sleumer* 7653 (K).

In the case of *C. sleumeri* and *C. schlechteni* the differential characters of androecium are rather less well marked; but a reliable specific distinction is readily obtained by the utilisation of other characters and they are presented in a tabular form. The presence of long sparsely branched multicellular hairs (5—6 mm long) and the densely pubescent 7 veined ovate leaves with rounded base and apiculate apex is characteristic for this species.



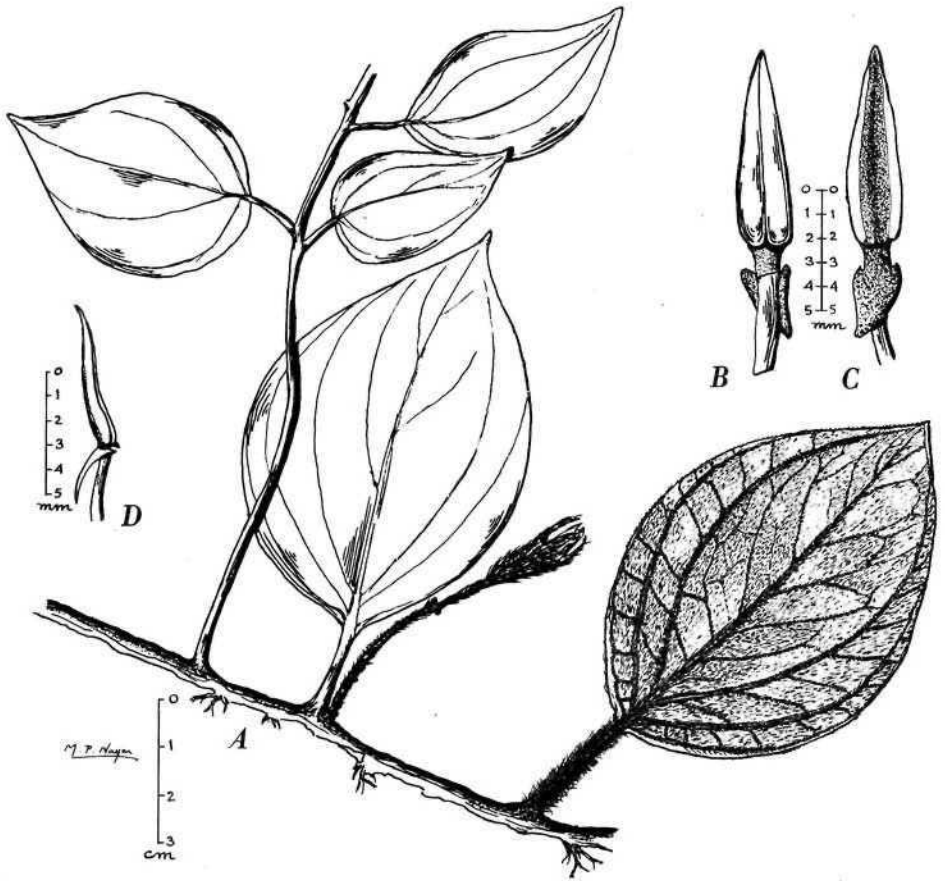


FIG. 8. *Catanthera sleumeri* Nayar (Based on van Royen & Steamer 7653) • A. Plant - actual size; B. Large stamen; ventral view x 5; C. Large stamen, dorsal view x 5; D. Small stamen x 5.

*C. sleumeri*

Leaf ovate, 5—10.5 cm X 3.5—6.8 cm.  
 Leaf 7-veined.  
 Leaf base rounded, apex caudate-acuminate.  
 Stem leaves and inflorescence covered with 5—6 mm long fulvous pubescence; pubescence persistent.  
 Hairs sparsely branched.  
 Calyx tube with lanceolate lobes.

*C. seklehteri*

Leaf elliptic 4—8 cm X 2.5—4 cm.  
 Leaf 5-veined.  
 Leaf base obtuse, apex acuminate.  
 Stem, leaves and inflorescence covered with 2—3 mm long ferrugineous pubescence; glabrescent in patches.  
 Hairs densely branched.  
 Calyx tube with linear lobes.

## 16. CATANTHERA SCHLECHTBRI (Mansf.) Nayar. — Fig. 9.

*Catantkera schlechteri* (Mansf.) Nayar in Gards. Bull. Singap. 24: 353. 1969. — *Phyllapophysis schlechteri* Mansf. in Engl. Bot. Jahrb. 60: 114, 1925; Ohwi in Jap. Bot. Mag. 57: 5. 1943. — Typus: New Guinea, *Schlechter 20117* (isotype K).

Climber. Branches young densely pinnato-pilose, angular. Leaves elliptic or ovate elliptic, 4—8 cm X 2.5—4 cm, base cuneate or rounded, apex acuminate, upper surface sparsely pinnato-pilose, pubescence deciduous and glabrous when old, lower surface densely pinnato-pilose, 5-nerved, cross venules on the upper surface inconspicuous, cross venules on the lower surface distinct and prominent; petiole 1.5—3 cm long, densely pinnate-pilose. Flowers axillary, solitary; peduncle 4—7 cm long, densely pinnate-pilose; bracteole linear 5-6 mm long, pilose; pedicel 1.8—2.2 cm long, densely pinnate-pilose. Calyx tube obconic, 1.2—1.5 cm long, densely pinnate-pilose, limb 4-lobed, lobes linear *G* mm long. Petals 4, ovate, 8—10 mm long. Stamens 8, unequal; larger stamens; filament 4—5 mm long, anther widely lanceolate, 8—9 mm long, 2.5—3 mm broad, connective shortly produced 0.8—1 mm long, dorsally ending in widely triangular spur 3—4 X 2 mm, ventrally ending in two tubercles; smaller stamens; filament 3—4 mm long, anther lanceolate 4—5 mm long, connective not produced, dorsally ending in a spur 2.5—3 mm long, ventrally ending in two tubercles. Ovary crescent with the calyx tube by 8 septa, extra-ovarian chambers 8, all descending to the base of the ovary, apex of the ovary furfuraceous. Style 10—12 mm long, base of style furfuraceous, stigma punctiform.

DISTRIBUTION: A tall climber which forms a canopy in evergreen forests; endemic to New Guinea.

NEW GUINEA. Papua: Torielli-Gebirges, alt. 700 m, 1 Sept. 1909, *Schlechter 20117* (K); West New Guinea: Jappen-Biak, Wamiami near seroei, 1 Aug. 1935, *Aet & Idjan 300* (K); Hollandia Dist, Cycloop mountains, path Ifar-Ornce, alt. 1220 m, 24 Jun. 1961, *van Royen & Sleumer 5996* (K, L).

In 1825 Mansfeld (in Engl. Bot. Jahrb. 60: 114. 1925) proposed the new genus *Phyllapophysis* on the basis of *Schlechter 20117* from New Guinea. In the key to the Papuan Dissochaeteae (in I.e. p. 113) Mansfeld placed the genus near *Omphalopus* Naud. on the basis of the phylloid dorsal appendage and reticulate anthers. The shape and orientation of the phylloid appendage in *Omphalopus* is quite characteristic and it is in no way related to this taxon. The anthers in *Omphalopus* are reticulate with bullate thecae, whereas in this species the anthers are not reticulate. It is presumed that Mansfeld might have been misled by the shrunken anthers in the herbarium material. This species is closely allied to *C. slevmcri* Nayar but for the nature of pubescence and the shape of leaves.

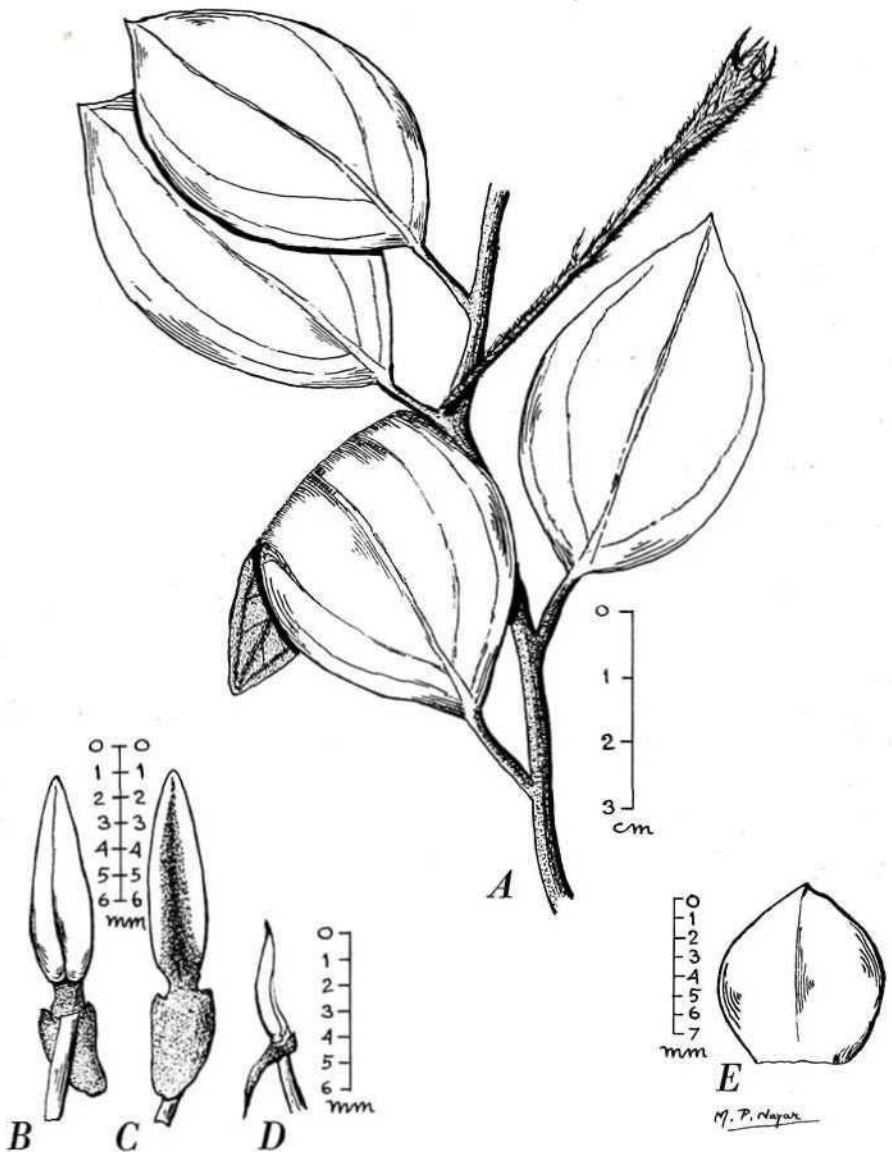


FIG. 9. *Catanthera schlechteri* (Mansf.) Nayar (Based on van Royen & Sleumer 5596). A. Plant - actual size; B. Large stamen, ventral view x 4; C. Large stamen, dorsal view x 4; D. Small stamen x 4; E. Petal x 3.

## ACKNOWLEDGEMENTS

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