

Orchidaceae Neotropicales V. Generis *Aganisiae* Synopsis

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Recent field work—especially in the northwestern Amazonia of Brazil and Colombia and the headwaters of the Orinoco in Venezuela—has made available for study interesting and ample material of several species of *Aganisia* which have hitherto been rather sparsely represented in our herbaria. In view of this new material, it would seem to be worthwhile to present a short synopsis of the orchidaceous genus *Aganisia* (including *Acacallis*) as a contribution towards a fuller understanding of that difficult complex of genera of the *Zygopetalinae* which are most closely related to *Aganisia*.

It is a pleasure for me to express my appreciation to Dr. Kurt Rechinger, director, and Dr. Kurt Fitz, technical assistant, of the Botanische Abteilung of the Naturhistorisches Museum in Vienna for the loan of 19 sheets of *Aganisia* (comprising specimens, analytical drawings, letters, and descriptions) from the Reichenbach Herbarium. I have also to acknowledge the kind cooperation of the authorities of the following herbaria for the loan of material in their care: Royal Botanic Gardens, Kew; Imperial College of Tropical Agriculture, Trinidad; New York Botanical Garden; Chicago Natural History Museum; and Smithsonian Institution, Washington, D. C. The present study has been based upon the collections in these herbaria, in addition to those preserved in the Gray Herbarium and the Orchid Herbarium of Oakes Ames at Harvard University.

It is not within the scope of this paper to review the relationships of the genera of the *Zygopetalinae*, especially *Aganisia*, *Koellensteinia*, *Olostylis*, *Paradisanthus* and *Wareella*. *Aganisia* (including *Acacallis*) may be distinguished at once, even vegetatively, from *Koellensteinia*, *Olostylis*, and *Paradisanthus*, since it has a greatly elongated rhizome with distant pseudobulbs and a scandent, epiphytic habit, as contrasted to a short rhizome with aggregated pseudobulbs and a terrestrial habit. *Wareella* is unique in this group of genera in having no evident pseudobulbs.

My research leads me to the conclusion that the two generic concepts which have been called *Aganisia* and *Acacallis* are not sufficiently distinct to warrant continued maintenance as separate entities. Botanists who have worked on the problem are at variance. Bentham (Bentham, G. in Journ. Linn. Soc. Bot. 18 (1881) 30; Bentham, G. and Hooker, J. D. "Genera Plantarum" 3 (1883) 544) maintained *Aganisia* and *Acacallis* as separate concepts. Schlechter (Schlechter, R.: "Die Gattung *Aganisia* Ldl. und ihre Verwandten" in Orchis 12 (1918) 24-42) argued for keeping *Aganisia* and *Acacallis* as distinct. Hoehne (Hoehne, F. C. "Flora Brasiliica" 12, pt. 7 (1953) 155 ff.) followed Schlechter in his disposition of these two concepts. As early as 1888, however, Pfitzer (Pfitzer, E. "Orchidaceae" in Engler-Prantl: "Die natürlichen Pflanzenfamilien" 2, Abt. 6 (1888) 164, 166) united the two. In January 1944, Mr. Charles Schweinfurth, in a

handwritten annotation in the Orchid Herbarium of Oakes Ames, stated: "I do not agree that *Acacallis* is specifically distinct from *Aganisia*"; and, in his forthcoming "Orchids of Peru", he continues to treat *Acacallis* as synonymous with *Aganisia*.

The characters which have been employed to separate *Aganisia* from *Acacallis* appertain primarily to the structure of the callus of the lip and to the presence or absence of a distinct claw. Study of the ampler material now available indicates that there is some variability in the amount and form of verrucosity and lobing of the callus. Furthermore, there is appreciable variability in the distinctness and length of the claw in flowers from different plants and of its degree of fusion with the column base. I cannot find either in the literature or in the material which I have studied any additional differences by which the two concepts may be distinguished. In view of the relatively minor nature of these characters and the obvious variability in them, I concur with Pfitzer and Schweinfurth in reducing *Acacallis* to synonymy under *Aganisia*.

Schlechter (loc. cit.) and Hoehne (loc. cit.) have outlined the historical development of our knowledge of *Aganisia*, but it may be worthwhile to repeat it briefly here, especially since my point of view differs taxonomically.

Aganisia was described in 1839 by Lindley for a species collected in British Guiana which he named *A. pulchella*. One year later (in Bot. Reg. 25 (1840) t. 32), an illustration was published. The material collected in British Guiana flowered in England. Lindley wrote that if "its column were produced into a foot, and the lower sepals unequal at the base, it would be a *Maxillaria* . . .".

Thirteen years later, Lindley proposed the genus *Acacallis*, describing *Acacallis cyanea*, based on material gathered by Spruce in the basin of the Rio Negro of the Brazilian Amazon, stating that it had relationships with *Humileya*, *Warrea* and *Paradisanthus* but not mentioning its closeness to *Aganisia*. In 1869, Reichenbach recognized it as a species of *Aganisia* and made the indicated transfer. In the same year, he described as *Aganisia lepida* material collected on the Rio Negro in Brazil.

A third species of *Aganisia* was proposed in 1874 by Reichenbach when he described *A. fimbriata* on the basis of material collected in British Guiana and brought to flower in England.

Two years later, Reichenbach described *Aganisia coerulea* from material collected somewhere in Brazil and brought to flower in the Hamburg Botanical Garden.

Shortly thereafter, in 1878, he proposed *Aganisia Oliveriana* for a Brazilian plant that flowered also in the Hamburg Botanical Garden, indicating that its affinities lay with *A. fimbriata*. A drawing of *Aganisia Oliveriana* appeared in 1883.

Bentham (Bentham, G. in Journ. Linn. Soc. London, Bot. 18 (1881) 320) suggested that *Koellensteinia* should be united with *Aganisia*, and this was carried out by Nicholson (Nicholson, Dictionary of Gardening, 1 (1885) 35). The result was an additional binomial under *Aganisia* (*A. ionoptera*).

In 1885, N. E. Brown described *Aganisia tricolor* from plants which

had been introduced from the Amazonian regions, presumably of Brazil. Brown pointed out that it differed from *Aganisia cyanea* primarily in color.

Ridley proposed *Aganisia alba* in 1886 from material collected in British Guiana by the Roraima Expedition.

Schlechter created a monotypic genus—*Kochiophyton negrense*—in 1906, for a collection from the Rio Negro of Brazil, and several years later Hoehne added a second species—*K. coeruleus*. Schlechter himself later reduced both species to synonymy under *Aganisia cyanea*.

Another binomial—*Aganisia boliviensis*—was published by Rolfe in 1907 for a plant from Bolivia which he himself indicated to be very close to "*Aganisia ionoptera* Nichols."

A final binomial under *Aganisia* was proposed by Schlechter in 1925, when he described *A. brachypoda* from a collection made in the upper Rio Negro basin of Brazil.

AGANISIA Lindley in Bot. Reg. 25 (1839) Misc. 65, p. 45; *ibid.* 26 (1840) t. 32; Endlicher Gen. Plant., Suppl. 1 (1840) 1363; Beer Prakt. Stud. Fam. Orch. (1854) 187; Duchartre Man. Gen. Plant. 4 (1857) 474; Reichenbach fil. in Walpers Ann. Bot. 6 (1861) 504; Beitr. zur Orchideenk. (1869) 9; DuBuysson L'Orchid. (1878) 180; Bentham & Hooker fil. Gen. Plant. 3 (1883) 544; N. E. Brown in Lindenia 1 (1885) 95; Pfitzer in Engler & Prantl Die Natürl. Pflanzenfam. 2, Abteil. 6 (1888) 166; Stein, Orchideenb. (1892) 66; in L'Orchidoph. 2 (1892) 84; Bois Orch. (1893) 128; Kerchove Livre des Orch. (1894) 267; Williams Orch.-Grow. Man., ed. 7 (1894) 93; Schlechter Die Orchideen (1915) 418; in Orchis 12 (1918) 10; Hoehne Iconogr. Orch. Brasil. (1949) 221; Flora Brasílica 12, 7 (1935) 155; Ospina Orquid. Colomb. (1958) 179, 180.

Acacallis Lindley Fol. Orch. (1853) *Acacallis*; Reichenbach fil. in Walpers Ann. Bot. 6 (1861) 505; Bentham in Journ. Linn. Soc. London, Bot 18 (1881) 320; Bentham & Hooker fil. Gen. Plant. 3 (1883) 544; L'Orchidoph. (1892) 84; Veitch Man. Orch. Plants 9 (1893) 69; Cogniaux in Journ. des Orch. 4 (1894) 320; Linden Orch. Exot. (1894) 563; Cogniaux in Martius Fl. Bras. 3, pt. 5 (1902) 524; Schlechter Die Orchideen (1915) 418; in Orchis 12 (1918) 11; Hoehne Iconogr. Orch. Brasil. (1949) 221; Flora Brasílica 12, 7 (1953) 160; A. D. Hawkes in Orch. Journ. 2 (1953) 98.

Kochiophyton Schlechter ex Cogniaux in Martius Fl. Bras. 3, pt. 6 (1906) 574, t. 119; in Koch-Grünberg Zwei Jahre unter den Indianern 2 (1910) 364.

Epiphytic or terrestrial herbs, often creeping and almost vine-like. Pseudobulbs very small, cylindrical to fusiform, usually completely hidden by long, sheathing bracts, usually 1-foliate (rarely 2- or 3-foliate). Leaves petiolate, plicate, papyraceous. Inflorescence a lateral, lax, short-pedunculate, erect or arcuate, several- to 10-flowered raceme. Flowers usually large and showy, short-pedicellate. Bracts small. Sepals free, spreading. Petals subsimilar to sepals. Lip sessile to long-clawed, 3-lobed or simple; lateral lobes (when present) usually small; mid-lobe more or less concave, spreading, large, often emarginate or sublobulate; disk prominently cristate. Column short.

erect, with or without foot, conspicuously winged and 2-auriculate at apex. Anther terminal, opercular, incumbent, 1-celled. Pollinia 4, waxy, complanate-obovoid.

Aganisia: from the Greek, signifying "pleasing to the sight".

A genus of three species known from northern South America and Trinidad.

KEY TO THE SPECIES OF AGANISIA

- I. Margins of mid-lobe of lip entire or subentire. Basal lobes of lip relatively conspicuous, broadly rounded. Flowers white or yellowish with a few red or purple spots at base of lip.....3. *Aganisia pulchella*
- Ia. Margins of mid-lobe of lip not entire. Basal lobes of lip very small, obtuse or subacute. Flowers predominantly pale blue or brownish blue.
- II. Lip long-clawed, 25-30 mm. long (including claw). Mid-lobe of lip irregularly and minutely crenulate-dentate. Callus of lip irregularly verrucose, 8 mm. high.....1. *Aganisia cyanea*
- IIa. Lip short-clawed, up to 14 mm. long (including claw). Mid-lobe of lip fimbriate. Callus of lip triangular-lobulate, 2-3 mm. high.....
2. *Aganisia fimbriata*

1. *AGANISIA CYANEA* (Lindl.) Reichenbach fil. in Beitr. zur Orchideenk. (1869) 13, t. 4; Linden & Rodigas in Lindenia 3 (1887) 31, t. 110; Veitch, Man. Orch. Plants 9 (1893) 68; Williams, Orch.-Grow. Man. ed. 7 (1894) 94; Ospina Orquid. Colomb. (1958) 179, 180, t. 8.

Acacallis cyanea Lindley Fol. Orch. (1853) *Acacallis*; Reichenbach fil. in Walpers Ann. Bot. 6 (1861) 505; Veitch, Man. Orch. Plants 2 (1885) 70; Cogniaux in Martius Fl. Bras. 3, pt. 5 (1902) 524; Rolfe in Orch. Rev. (1907) 40; Curtis' Bot. Mag. s. 4, 12 (1916) t. 8678; Gard. Chron. 60 (1916) sub "Book Notices"; Hoehne in "Com. Lin. Tel. Estr. Matto-Grosso Amazonas" Ann. 5, Bot. Parte 9 (1916) 33; Schlechter in Orchis 12 (1918) 12, t. 1, figs. 9-10; Orch. Rev. 36 (1928) 281; Garnett in Orch. Rev. 37 (1929) 45, 47; *ibid.*, 38 (1930) 205, 219; *ibid.*, 45 (1937) 174; Hoehne in Arch. Inst. Biol. 8 (1937) 282; Am. Orch. Soc. Bull. 6 (1937) 20, t.; Orch. Rev. 46 (1938) 113; Hoehne "Inconogr. Orch. do Brasil" (1949) 86, 87, 94, 221, t. 225; Hoehne "Ind. Bibl. e Num. Pl. Col. Com. Rondon" (1951) 165; Orch. Rev. 59 (1951) 144; Orch. Journ. 2 (1953) F6, t. 38; Fl. Brasilica 12, pt. 7 (1953) 161, t. 73; Am. Orch. Soc. Bull. 26 (1957) 101.

Aganisia tricolor N. E. Brown in Lindenia 1 (1885) 95, t. 45; Williams, Orch.-Grow. Man., ed. 7 (1894) 95; E. S. Rand (ex Am. Gard.) in Orquidea 8 (1945) 66.

Aganisia coerulea Reichenbach fil. in Gard. Chron., n.s., 25 (1886) 720; Warner & Williams, Orch. Alb. 8 (1889) 374.

Kochiophyton negrense Schlechter ex Cogniaux in Martius Fl. Bras. 3, pt. 6 (1906) 574; Schlechter in Koch-Grünberg "Zwei Jahre unter den Indianern" 2 (1910) 365, t.p. 366; Schlechter in Orchis 12 (1918) 13.

Kochiophyton coeruleus Hoehne in Com. Lin. Flor. Matto-Grosso, Anexo 5, pt. 1 (1910) 49, t. 39.

Acacallis Hoehnei Schlechter in Orchis 12 (1918) 14.

Epiphytic herb. Rhizome repent, up to 5 mm. in diameter, sometimes up to 4-5 m. long, covered with distichous, appressed sheaths, especially in young state. Pseudobulbs distant, 3-20 cm. apart, usually fusiform, slightly beaked, 3-7 cm. long, covered (initially at least) by long, papery, accrescent sheathing bracts, usually 1-foliate. Leaf firmly membranaceous, elliptic to oblanceolate, short-acuminate, basally cuneate, 10-30 cm. long, 4-10.5 cm. wide, with 7 prominent veins beneath; petiole rather stout, channelled, up to 6 cm. long. Inflorescence long-pedunculate, usually about as long as the leaf, nodding, laxly 2 to 10-flowered. Bracts ovate-triangular, 4-5 mm.

long. Flowers large, conspicuous, pale blue with copper-purplish or wine-colored lip and whitish, brownish or brown-purple column, 3-4.5 cm. in diameter (rarely larger). Sepals and petals spreading, ovate to subrotund, usually apiculate, basally cuneate, 3 cm. long, 2 cm. wide; petals often undulate, commonly slightly smaller than sepals but sometimes wider. Lip long and narrowly clawed, 3-lobed, 25-30 mm. long (including claw); lateral lobes erect-spreading, minute, triangular-dentiform, subacute, 1.5-2 mm. long; mid-lobe thin-membranaceous, pinkish blue to rose-purple, somewhat concave, flabellate, basal margins entire, lateral margin irregularly and minutely crenate-dentate, sometimes apparently lightly emarginate apically, about 15-17 mm. long, 22-27 mm. wide; callus yellowish, fleshy, cristate, irregularly verrucose, 7.5-8 mm. high. Column brownish or white, erect, slightly arcuate, slender, triquetrous or semiterete, up to 17 mm. long, above with 2 membranaceous, suborbicular, reddish or purplish, auricular wings.

BRAZIL: Estado do Amazonas, Rio Negro, "Barra [Manáos]. On trees by forest streams". July 1851, *R. Spruce 1790* (Hb. Kew; Hb. Benth.).—Estado do Amazonas, Rio Uaupés, "Secus cataractam Panuré [Ipanoré]. January 1853. *R. Spruce 1790* (Hb. Kew; Hb. Benth.; Hb. Hook.).—Estado do Amazonas, Rio Negro, near Lake Maracapuri. No date. *E. Morris s.n.* (Hb. Reichenb. 40591, 30476).—Estado do Amazonas, Rio Negro, Uaupés (São Gabriel) and vicinity. "Epiphyte. Flowers pale blue." October 15-19, 1947. *R. E. Schultes & F. López 8943* (Hb. Ames 67534).—Estado do Amazonas, Rio Uaupés, Serra Wabeese, left bank below Bela Vista, between Ipanoré and confluence with Rio Negro. "Epiphyte, Flowers blue." November 17, 1947. *R. E. Schultes & J. Murça Pires 9141* (Hb. Ames 67520).—Estado do Amazonas, Rio Negro, São Felipe and vicinity. Igarapé Imutá, opposite mouth of Rio Issana. "Epiphyte with flowers light bluish." April 4-7, 1948. *R. E. Schultes & F. López 9765* (Hb. Ames 68527).

COLOMBIA: Comisaría del Vaupés, Río Vaupés, mouth of Karurú, along banks of creek. Altitude about 230 m. "Epífita; flor grande, azul pálido; ginostemo morado y blanquecino." September 27, 1939. *J. Cuatrecasas 7055* (U. S. Nat. Herb. 1796667).—Comisaría del Amazonas, Río Karaparaná, between the mouth and El Encanto. Altitude about 150 m. "Epiphyte. All of flower lilac except lip brown-lilac." May 22-28, 1942. *R. E. Schultes 3813* (Hb. Ames 67515, 67516).—Comisaría del Vaupés, Río Kananari, Cerro Isibukurí. Near base of mountain. Altitude about 250 m. "Epiphyte. Flowers blue; lip purplish." June 13, 1951. *R. E. Schultes & I. Cabrera 12510* (Hb. Ames 68219). Same locality and date. *Schultes & Cabrera 12511* (Hb. Ames 68220).—Comisarias del Vaupés and Amazonas, Río Apaporis, entre el río Pacoa y el río Kananari, Soratama. Altitude 250 m. "Delicate violet. Lip brownish violet. Epiphyte." June 21, 1951. *R. E. Schultes & I. Cabrera 12739* (Hb. Ames 68408). Same locality. June 25, 1951. *Schultes & Cabrera 12815* (Hb. Ames 68407). Same locality. June 26, 1951. *Schultes & Cabrera 12837* (Hb. Ames 68409). Same locality. July 4, 1951. *Schultes & Cabrera 12882A* (Hb. Ames 68221). Same locality. July 5, 1951. *Schultes & Cabrera 12892* (Hb. Ames 68413).—Comisaría del Vaupés, Río Piraparaná, Caño Oo-mooña. "Epiphyte, Fl. blue." September 3, 1952. *R. E. Schultes & I. Cabrera 17149* (Hb. Ames 68547, 68548).—Comisaría del Vaupés, Río Piraparaná, Caño Teemeña. "Epiphyte. Flowers blue." September 6, 1952. *R. E. Schultes & I. Cabrera 17265* (Hb. Ames 68420).—Comisaría del Vaupés, Río Paca, Wacaricuara and vicinity. Altitude about 650 feet. "Epiphyte. Flowers pale bluish." June 1-3, 1953. *R. E. Schultes & I. Cabrera 19517* (Hb. Ames 68406). Comisaría del Vaupés, Río Kuduyari, along banks. "Epiphytic, crawling. Flowers blue with purple-brown lip. Floral axis brown-purple. In shade." June 23-26, 1953, *H. García-Barriga, R. E. Schultes & H. Blohm 15783* (Hb. Ames 69350). Same locality and date, *H. García-Barriga, R. E. Schultes & H. Blohm 15784* (Hb. Ames 69349). Same locality and date, *H. García-Barriga, R. E. Schultes & H. Blohm 15785* (Hb. Ames 69348). Same locality and date, *H. García-Barriga, R. E. Schultes & H. Blohm 15787* (Hb. Ames 69347). Same

locality and date, *H. García-Barriga, R. E. Schultes & H. Blohm 16790* (Hb. Ames 69346). Same locality and date. *H. García-Barriga, R. E. Schultes & H. Blohm 16793* (Hb. Ames 69345). Same locality and date. *H. García-Barriga, R. E. Schultes & H. Blohm 16798* (Hb. Ames 69344). Same locality and date. *H. García-Barriga, R. E. Schultes & H. Blohm 15816* (Hb. Ames 69343).—Comisaría del Vaupés, Río Kuduyari, near Savannah Yapobodá, June 26, 1958, *H. García-Barriga, R. E. Schultes & H. Blohm 16021* (Hb. Ames 69342).—Comisaría del Vaupés, Río Kubiýú, June 30, 1958, *H. García-Barriga, R. E. Schultes & H. Blohm 16062* (Hb. Ames 69341).

VENEZUELA: Territorio del Amazonas, Río Orinoco, Esmeraldas. "In arboribus." No date. *Bonpland 1189*. (Hb. Reichenb. 40587).—Territorio del Amazonas, Río Cuao, [affluent of] Río Orinoco. Altitude 125 m. "Terrestrial. 5 outer perianth members pale blue; lip deep purple mauve; column wings reddish." November 25, 1948, *B. Maguire & L. Polak 27393*. (Hb. N. Y. B. G.; Hb. Ames 68210).—Territorio del Amazonas, Ríos Pacimoni-Yatua [affluents of] Casiquiare, flooded forest along uppermost Río Yatua. Altitude 100-140 m. "Epiphyte on living tree trunk, forming vine 1 m. long. Inflorescence purplish; perianth blue, the lip copper-purplish; column purple basally, white apically." December 12, 1953, *B. Maguire, J. J. Wurdack & G. S. Bunting 36762* (Hb. N. Y. B. G., Hb. Ames 67820A, 68210B).—Territorio del Amazonas, Ríos Pacimoni-Yatua [affluents of] Casiquiare. Along uppermost Río Yatua, above mouth of Río Yacibo. Altitude 100-140 m. "Epiphyte. Flowers blue-lavender; lip wine-colored." January 30-31, 1954, *B. Maguire, J. J. Wurdack & G. S. Bunting 37448* (Hb. N. Y. B. G., Hb. Ames. 67820, 68210A).

Aganisia cyanea ranges throughout the northwestern Amazon of Brazil and Colombia and the headwaters of the Orinoco in Venezuela. Its centre of distribution appears to lie along the Río Vaupés and its tributaries, where it is very abundant, but collections also indicate that it is not uncommon in the Territorio del Amazonas in Venezuela.

In the forest, *Aganisia cyanea*, with its pale bluish and moderately large flowers, is indeed a thing of rare beauty where colours—especially blues—are seldom in evidence. The orchid climbs up trunks and branches in the densest part of the riparian forests which, during part of the year, is deeply flooded. The repent rhizome may reach a length of fifteen or even twenty feet. It might be interesting to reproduce here Spruce's field notes concerning the type collection of *Aganisia cyanea*, since they seem never to have been published. Exclusive of a detailed description of the flower, Spruce wrote: "R. da cachá on tree trunks by a forest stream. Stems jointed, applied to bark of tree, here and there producing a small bulb and a stalked leaf, and clad with persistent fibres of (bulb-) sheath. Lvs. thinnish, ribbed, elongate-obov. abruptly apic. ac. Axillary few-fl., racemes 12 in. with membr. bracts. Fls large, explan. Seps & pets. subeq., suborbic., apic., light blue (paler within). Lip light brnsh. [=brownish]—purp. with pale veins. Column with 2 cuneate wings at apex; back & wings streaked with red."

In its floral structure, *Aganisia cyanea*, whose flower is very much larger than that of any other species, would seem to stand in an intermediate position between *A. pulchella* and *A. fimbriata*. This is especially true of the structure of the lip.

In 1886, Reichenbach filius referred to "*Aganisia coerulea* Rchb. f.," which "as the *Acacallis coerulea* of Dr. Lindley, is, no doubt, the best Orchid gathered by Dr. Spruce. It was found on the Río Negro in 1851 by this excellent traveller, and is his No. 1790." Thus, through the citation of Spruce's number as well as from Reichenbach's description, we know that he erroneously applied this name to *Aganisia cyanea*,

a most unfortunate happening, since his name *Aganisia coerulea*, published ten years before, referred to a wholly different species, now considered to be synonymous with *A. fimbriata*.

2. *AGANISIA FIMBRIATA* Reichenbach fil. in Gard. Chron., n.s., 2 (1874) 452; Cogniaux in Martius Fl. Bras. 3, pt. 5 (1902) 523.

Aganisia coerulea Reichenbach fil. in Gard. Chron. n.s., 6 (1876) 2, 226; Williams, Orch. Grow. Man., ed. 7 (1894) 94, t.; Kew Bull. 4 (1896) 13; Cogniaux in Martius Fl. Bras. 3, pt. 5 (1902) 522.

Aganisia Oliveriana Reichenbach fil. in Gard. Chron. n.s., 9 (1878) 1, 558; Xenia Orch. 3 (1883) 52, t. 223; Kew Bull. Suppl. 4 (1896) 13; Cogniaux in Martius Fl. Bras. 3, pt. 5 (1902) 521.

Acacallis Oliveriana (Rchb. f.) Schlechter. Die Orch. (1914) 419; in Orchis 12 (1918) 15; Hoehne, Fl. Brasilica 12, pt. 7 (1953) 164, t. 70.

Acacallis fimbriata (Rchb. f.) Schlechter in Orchis 12 (1918) 10; Hoehne, Fl. Brasilica 12, pt. 7 (1953) 165.

Acacallis coerulea (Rchb. f.) Schlechter in Orchis 12 (1918) 14; Hoehne, Fl. Brasilica 12, pt. 7 (1953) 163, t. 69.

Epiphytic herb. Rhizome scandent or long-repent, covered with distichous, appressed sheaths (especially in young state), 6-9 mm. in diameter. Pseudobulbs about 5 cm. apart, fusiform or long-cylindric, slightly beaked, covered (initially at least) by long, membranaceous, accrescent sheathing bracts, 5-7 cm. long, usually 1-foliate. Leaf firmly membranaceous, elliptic to oblong-lanceolate, acute or acuminate, basally cuneate, 18-30 cm. long, 6-7.5 cm. wide, with 5-7 prominent veins beneath; petiole rather stout, channelled, up to 8 cm. long. Inflorescence long-pedunculate, usually about one-half as long as leaf or sometimes shorter, nodding, laxly 2- to 9-flowered. Bracts lanceolate, about 10 mm. long. Flowers large, conspicuous, sometimes pale yellow and white with pale blue-violet lip, often with reddish or dark blue markings. Sepals and petals spreading. Sepals elliptic to obovate, subacute, slightly undulate, 15-22 mm. long, 9-14 mm. wide; lateral sepals somewhat oblique. Petals obovate to orbicular-ovate, acute or almost rounded, basally cuneate, up to 18 mm. long, 13 mm. wide. Lip short-clawed, 3-lobed, 9-14 mm. long (including claw); lateral lobes erect-spreading, minute, triangular-dentiform, usually subacute, 0.7-1.5 mm. long; mid-lobe membranaceous, deeply concave to subsaccate, flabellate (sometimes suborbicular), basal margins entire, lateral margin deeply fimbriate, often lightly emarginate apically, 8-11 mm. long, up to 11-20 mm. wide; callus fleshy, triangular-lobulate, 2.5-3 mm. high. Column erect, stout, 5-7 mm. long, semiterete, above with 2 membranaceous, triangular or subquadrate auricular wings.

BRAZIL: No precise locality. Cult. and flowered at Hamburg Bot. Gard. No date. (TYPE of *Aganisia Oliveriana* in Hb. Reichenb. 33794, 40589).—Estado do Pará, Distrito Acará, Thomé Assú, Agua Branca, "On trunk of sapling in forest. Perennial herb. Flower lilac." *Y. Mexia 5956a* (Hb. Univ. Cal.).—Estado do Amazonas, Igarapé da Cachoeira Alta Umido. Mata virgem. August 7, 1956. *Ermani 4051* (Hb. Garay 6162).

BRITISH GUIANA: Demerara (cultivated in England) *J. F. Salter s.n.* (TYPE in Hb. Reichen. 40596).

COLOMBIA: Comisaría del Amazonas, Río Karaparaná, Entre Ríos. "A monophyllous orchid; flattened ovoid pseudobulbs; flowers white shot with blue." October 1910, *W. Fox 35* (Hb. Kew).

PERU: Departamento de Loreto, Mishuyacu, near Iquitos. Altitude 100 m. In forest. "Fls. pale violet." *Klug 590* (U. S. Nat. Herb. 1455529).—Departa-

mento de Loreto, near Iquitos. Altitude 100 m. "In virgin forest." June, 1925. *G. Tessmann 5166* (Hb. Berol., photograph and analytical drawing in Hb. Ames 37020).—Departamento de Loreto, Mishuyacu, near Iquitos. Altitude 100 m. "Epiphyte. 3 sepals pale blue; 2 sepals pale blue with deeper stripes. Column white. Lip pale blue with deep blue fringes." September 24–28, 1920, *E. P. Killip & A. C. Smith 29984* (Hb. Ames 62079).—Departamento de Loreto, Mishuyacu, near Iquitos. Altitude 100 m. Forest. "Flowers white and rose-violet." April 1930, *G. Klug 1239* (Hb. Field Mus. 625002; U. S. Nat. Herb. 1456250).—Departamento de Loreto, Mishuyacu, near Iquitos. Altitude 100 m. Forest. "Fls. blue-lilac." April 1930. *G. Klug 1257* (U. S. Nat. Herb. 1456262; Hb. Field Mus. 624990).—Departamento de San Martín, Chazuta, Rio Huallaga. Altitude about 260 m. "Flowers pale and dark lilac." March 1935, *G. Klug 3985* (Hb. Kew; U. S. Nat. Herb. 1458411; Hb. Gray 6001).

Specimen number 40589 from the Reichenbach Herbarium, the type of *Aganisia Oliveriana*, was prepared from cultivated material with no indication as to the country of origin of the plant. In his description of *Aganisia Oliveriana*, however, Reichenbach stated that the species came from Brazil. The type and only collection of *Aganisia fimbriata* consists of two flowers and several excellent floral drawings. There is, attached to the type specimen, a letter from J. T. Salter, Esq., of Laurie Park, Sydenham, England, to Reichenbach, which gives data of interest from a taxonomic point of view: "In answer to your enquiry concerning the habits of *Aganisia* named by you *fimbriata*, I decidedly name it a stiff climber. The stem $\frac{1}{2}$ inch to $\frac{3}{8}$ inch thick with bulbs (pseudo) rather close to stem at 2 inches apart alternate sides, shape of pseudobulbs of an elongate oval terminated with 3 to 4 leaves, length of pseudobulbs $1\frac{1}{2}$ inches, width about $\frac{1}{2}$ inch, leaves leathery, something after a weakly growth of *Coelogyne Lowii*, when received was clasping a small branch firmly (in close contact) by its rooty stem—a native of Demerara, was sent over with *Paphinia cristata* . . . the specimen sent was from a very weakly break, the bulb hardly one-sixth the size of the imported ones makes me think we can hardly judge the value of the plant as a spike with 18 to 20 flowers would be very pretty."

A study of the flowers of the type of *Aganisia fimbriata* in the Reichenbach Herbarium indicates that the differences between this concept and those later described by Reichenbach as *A. coerulea* and *A. Oliveriana* are of such a trivial nature that not even varietal distinctions could reasonably be established for them. Therefore, I am reducing *Aganisia coerulea* and *A. Oliveriana* to synonymy under the earlier *A. fimbriata*. Sketches made by Reichenbach and preserved in his herbarium show the lip of *Aganisia fimbriata* as very deeply saccate or even hemispherical, but careful examination of one of the two flowers of the type boiled soft and floated out in water, convinces me that the lip has been incorrectly interpreted and that it is hardly subsaccate. The flower is smaller, and the lip tends to be somewhat more deeply concave than in our ample material which has hitherto been referred to *Aganisia coerulea*. A glance at the accompanying plate, nevertheless, will show that there are, in reality, no significant differences between the two concepts.

3. *AGANISIA PULCHELLA* Lindley in Bot. Reg. 25 (1839) Misc. 65 p. 45; *ibid.* 26 (1840) t. 32; Beer, Prakt. Stud. Orch. (1854) 187; Reichen-

bach fil. in Walpers Ann. Bot. 6 (1862) 505; Du Buysson, L'Orchid. (1878) 180; Stein, Orchideenb. (1892) 66; Veitch, Man. Orch. Pl. 9 (1893) 69; Bois, Orchid. (1893) 128; Williams, Orch.-Grow. Man., ed. 7 (1894) 94; Linden, Orch. Exot. (1894) 577; Cogniaux in Martius Fl. Bras. 3, pt. 5 (1902) 521; Broadway in Orch. Rev. 34 (1926) 134; Schlechter in Orchis 12 (1918) 10, fig. 1; Hoehne, Icon. Orch. Bras. (1949) 221, t. 211; Hoehne, Fl. Brasilica 12, pt. 7 (1935) 158, t. 68; A. D. Hawkes in Orch. Journ. 2 (1953) 180.

Aganisia brachypoda Schlechter in Beih. Bot. Centralbl. 42, Abt. 2 (1925) 126; Hoehne, Fl. Brasilica 12, pt. 7 (1953) 159.

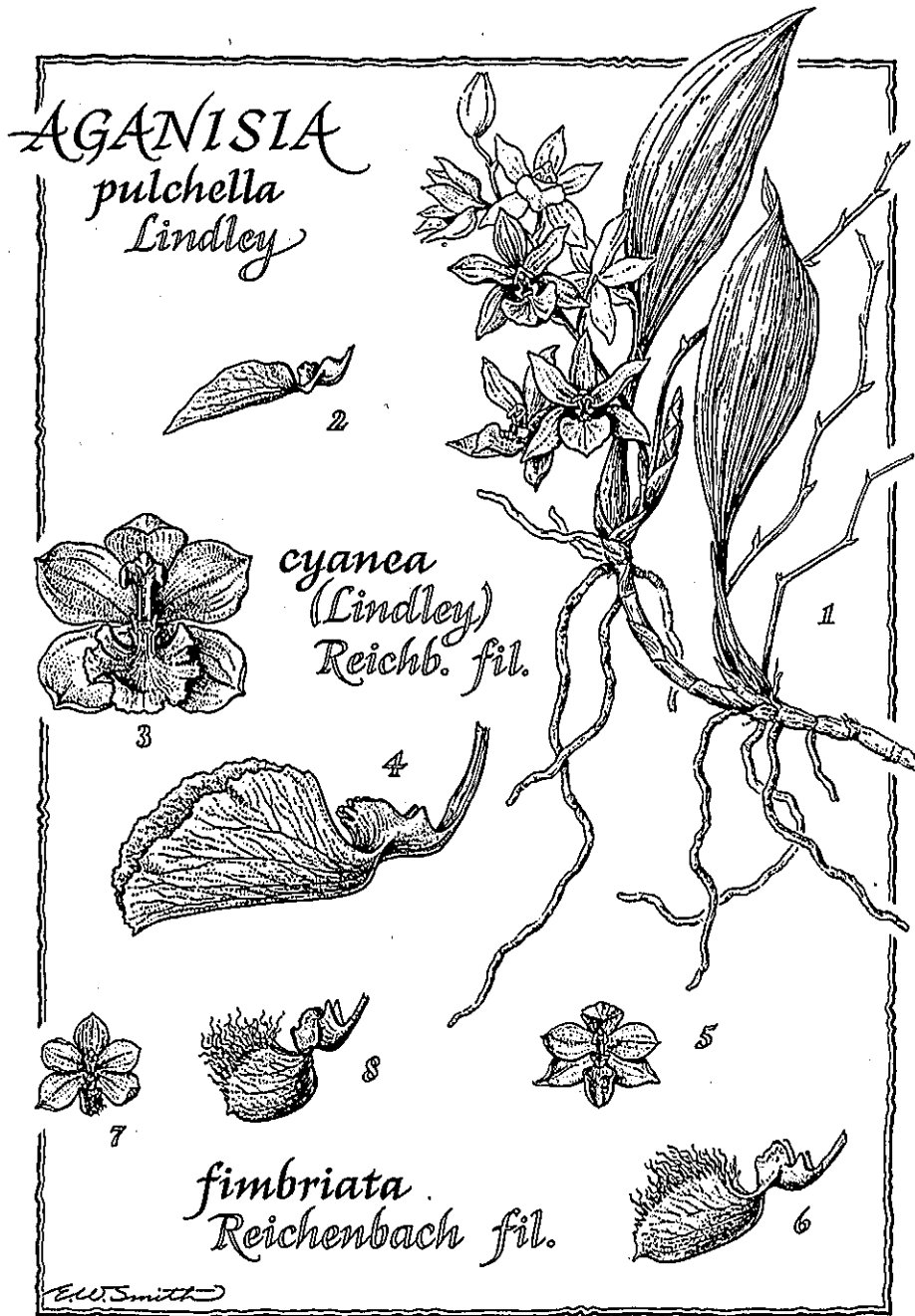
Epiphytic herb, often with very long, creeping rhizome up to 3-4 mm. in diameter. Pseudobulbs small, about 2 cm. long, covered (initially at least) by long, papery, accrescent sheathing bracts. Leaf firmly membranaceous, elliptic or oblong-elliptic, acuminate, 10-18 cm. long, 3-4 cm. wide; petiole slender, 4-6 cm. long. Inflorescence short-pedunculate, erect, 3- to 8-flowered, shorter than the leaves. Bracts triangular-ovate, 3-4.5 mm. long. Flowers showy, 3 cm. in diameter, white with lip tinged with yellow (crest) and basally red- or purple-spotted. Sepals and petals spreading, subequal, oblong or oblong-ovate, acutish, 12-13 (rarely up to 19-20) mm. long, 7-8 mm. wide. Lip subsessile, 3-lobed; basal portion ("hypochile") deeply concave, somewhat rhombiform with erect sides; mid-lobe ("epichile") suborbicular, ovate or subtriangular, entire or very minutely crenulate, apically rounded or obtuse, 11-12 (rarely up to 15) mm. long, 10-12 mm. wide; lateral lobes broadly rounded, obtuse or subacute, 2-2.5 mm. long; callus apparently yellow, fleshy, cristate, irregularly verrucose, 1.5 mm. high. Column erect, semiterete, 5 mm. long, footless, apically with auriculate, falcate wings.

BRITISH GUIANA: *E. F. in Thurn C.N. 13* (Hb. Kew).—East Coast Water Conservancy, southeast of Georgetown; canal southeast of Lamaha Stop-off "On trees in wet forest." November 27, 1919. *A. S. Hitchcock 16992* (Hb. Ames 17658; Hb. Gray 5999; U. S. Nat. Herb. 1056182; Hb. N. Y.).—Vicinity of Bartica, on the Essequibo River, lat. 6°25'N. "Flowers white with yellow and purple spots." September 3-12, 1922. *J. S. de la Cruz 2000* (Hb. Ames 68586; Hb. Gray 6000; U. S. Nat. Herb. 1190427; Hb. Field Mus. 542878; Hb. N. Y.).—Northwest District, Anabisi River. "Epiphyte. Flowers white and yellow." February 15, 1922. *J. S. de la Cruz 1370* (Hb. Ames 22983; Hb. N. Y.).—Upper Mazaruni River, Kamakusa. November 4, 1922, *Herbert Leng 21* (Hb. N. Y.).—Pakaraima Mountains, Membaru-Kurupung Trail. Altitude 1000 m. "Terrestrial or low epiphyte. Flowers white. Lip with yellow spot in centre and reddish processes at base. Locally frequent in *Cumuria* forest. October 29-November 1, 1951. *B. Maguire & D. B. Fanshawe 32341* (Hb. Ames 68526).

DUTCH GUIANA: Road from Moengo-tapoe to Grote Zwiebelzwamp. October 8, 1948. *J. Lanjouw & J. Lindeman 730* (Hb. Utrecht 073510).—Nassau Mountains, forested slope and summit, 400-500 m. alt., Morowijne River. "Epiphyte. Perianth green-white, lip white, bronze only at small lateral basal lobes." March 11, 1955. *Bassett Maguire 40792* (Hb. N. Y. Bot. Gard.).

TRINIDAD: Surinam River, Jodensavanne-Mapane Kreek area. "Flower white, labellum white with large yellow spot and purple spots and brown-red hairs at the base." May 5, 1953, *J. C. Lindeman 3966* (Hb. Ames 68439).—Aripo Savannah. "On tree in forest." March 5, 1920. *Dorothy Coker & W. R. Rowland s.n.* (Hb. Ames 68214; Hb. N. Y. Bot. Gard.).

VENEZUELA: Estado de Bolívar, 102 km. de El Dorado hacia Santa Elena. "Trepadora abundante en selva higrofitica macrotermica." December 29, 1956. *E. Foldvik 2676* (Hb. Ames 68529; Hb. Nac. Venez.).



There are in the Reichenbach Herbarium (40586) four collections of different provenience, one of which was from cultivated material. The labels are so incomplete or confused that they cannot be cited separately under countries.

Aganisia pulchella, the type species of the genus, is native to Trinidad and British and Dutch Guiana. In Trinidad, it is known only from the sandy savannah regions in the central part of the island. Dr. Wilbur G. Downs and Schultes collected a sterile specimen in July, 1958, in the Aripo Savannah; this is being cultivated but has not as yet flowered. Surprisingly few collections have been made in the field in the more than a century since this species was first described. It may also be registered through *Huebner 168* from the northwest Amazon of Brazil. Foldats has identified a second Venezuelan collection, *Cardona 2337* (Cerro Acopán, Estado de Bolívar) as representing *Aganisia pulchella*.

Perhaps the most distinct of the species of *Aganisia*, *A. pulchella* was thought for many years to be the only member of the genus. It is apparently the smallest representative of *Aganisia*, both vegetatively and florally. Several major floral characters, set forth in the key, further separate *Aganisia pulchella* from the other known species.

I have not been able to examine typical material of *Aganisia brachypoda* which was destroyed in the recent war. A study of its description, however, suggests to me that there is little, if any, difference of a fundamental nature upon which to erect a distinct species-concept. Schlechter said that his *Aganisia brachypoda* differed from *A. pulchella* by having shorter racemes with three or four (instead of four to six) flowers; by having smaller flowers which were entirely white (instead of having a cherry-red spot on the inner part of the lip; and in having longer and narrower leaves. *Aganisia pulchella* is usually footless, and Schlechter has indicated, by his choice of specific name, that the type of *A. brachypoda* possessed a short foot. The structure of the lip, according to Schlechter, differed from that of *Aganisia pulchella*, but I have been unable to find in his description of *A. brachypoda* any real differentiating characters in this organ. The type of *Aganisia brachypoda* (*Huebner 168*) was collected at Taracuí, on the Rio Uaupés, at the mouth of the Rio Tikié in Amazonian Brazil. Taracuí, the most westerly locality for *Aganisia pulchella*, lies not far from Ipanoré, Spruce's type locality of *Aganisia cyanea*, where many elements known also from British Guiana have been found. We, therefore, might expect *Aganisia pulchella* to occur in the north-western Amazonian area of Brazil. It may, likewise, turn up in Colombian territory.

EXCLUDED SPECIES

Aganisia boliviensis Rolfe ex Rusby in Bull. N. Y. Bot. Gard. 4 (1907) 448 = *Koellensteinia eburnea* (Barb.-Rodr.) Schlechter in Orchis 12 (1918) 28.

Except for a rather congested inflorescence, the type specimen *Bang 2909* in N. Y. Bot. Gard.) of *Aganisia boliviensis* (*Koellensteinia boliviensis* (Rolfe ex Rusby) Schlechter loc. cit. 32) would seem easily to be accommodated in the concept *K. eburnea*, which, according to Schweinfurth, may "be referable to *K. ionoptera* (Lind. & Reichenb.

fil.) Nichols, but at present the material at hand is insufficient to form a definite conclusion".

Aganisia brachystalix (Reichenb. f.) Rolfe in Orch. Rev. 22 (1914) 200 = *Otostylis brachystalix* Reichenb. f.) Schlechter in Orchis 12 (1918) 39, t. 5.

Reichenbach's *Aganisia brachystalix* agrees with the genus *Otostylis* as set up by Schlechter.

Aganisia graminea (Lindl.) Benth. & Hooker fil. Gen. Pl. 3 (1883) 544 = *Koellensteinia graminea* (Lindl.) Reichenbach fil. in Bonplandia 4 (1856) 323.

Aganisia graminea is merely a synonym of the widespread *Koellensteinia graminea* of Peru, Venezuela, Amazonian Brazil, the Guianas and Trinidad.

Aganisia ionoptera (Lind. & Reichenbach fil.) Nichols Dict. Gard. 1 (1888) 35 = *Koellensteinia ionoptera* Linden & Reichenbach fil. in Gard. Chron. (1871) 1471.

This concept is definitely referable to *Koellensteinia*.

Aganisia Kellneriana (Reichb. f.) Benth. in Bot. Mag. (1892) sub t. 7270 = *Koellensteinia Kellneriana* Reichenbach fil. in Bonplandia 2 (1854) 17, 281.

There can be no doubt that the concept described as *Aganisia Kellneriana* is referable to *Koellensteinia*. *Koellensteinia Kellneriana* may later prove to be synonymous with *K. eburnea*, but, for the present, I shall refer *Aganisia Kellneriana* to *K. Kellneriana*.

Aganisia lepida Linden & Reichenbach fil. ex Reichenbach fil. Beitr. Orchideenk. 15 (1869) t. 5a = *Otosyllis lepida* (Lind. & Reichenb. fil.) Schlechter in Orchis 12 (1918) 40.

Aganisia lepida represents a concept in Schlechter's genus *Otostylis*, in which it would seem to constitute a distinct species.

Aganisia venusta (Ridl. ex Oliver) Rolfe ex Hooker fil. in Bot. Mag. (1892) sub t. 7270 = *Otostylis alba* (Ridl. ex Oliver) Summerhayes in Kew Bull. 1951 (1951) 293.

A complete synonymy of *Otostylis alba*, to which *Aganisia venusta* (*Zygopetalum venustum*) Ridley (in Trans. Linn. Soc., ser. 2, Bot. 2 (1887) 283, t. 47, fig. 1-6)) is referred, may be found in Summerhayes (loc. cit. 293).