

A TAXONOMIC REVISION OF THE GENUS *ACRIOPSIS* REINWARDT EX BLUME (ACRIOPSIDINAE, ORCHIDACEAE)

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SUMMARY

This article presents a taxonomic revision of the genus *Acriopsis* (6 species, 5 varieties). One species (*A. gracilis*) and one variety (*A. javanica* var. *auriculata*) are described as new. Two species are reduced to variety level (*A. javanica* var. *floribunda*, *A. densiflora* var. *borneensis*). Twelve names are reduced to synonymy.

INTRODUCTION

Several opinions have been expressed on the position of the genus *Acriopsis* within the Orchidaceae. According to Schlechter (1915) *Acriopsis* belongs to the Vandaeae tribe. For the subtribe containing this genus and *Thecostele* he proposed the name Thecostelinae. The main reason for Schlechter to place these two genera together was because of the presence of a unique tubular structure, formed by the adnation of the base of the lip to the base of the column. In *Acriopsis* the lip is adnate to the column itself, no column foot is present. In *Thecostele*, however, it is adnate to an outgrowth of the column which projects to the front. Many authors followed the classification by Schlechter, with *Acriopsis* closely allied to *Thecostele*. Holttum (1953) also kept both genera together, but named the tribe 'Acriopsis tribe'.

Dressler & Dodson (1960) placed *Acriopsis* with a questionmark in the tribe Epidendreae of the Vandoid and Epidendroid orchids. They stressed that it may deserve a separate subtribe and that it is not related to *Thecostele* which was placed by them in the monotypic subtribe Thecostelinae.

Dressler (1981) treated the Epidendroideae and the Vandoideae as separate subfamilies. Within the latter, *Acriopsis* is classified as the only genus in the subtribe 'Acriopsidinae', which he described as new, in juxtaposition to the monotypic subtribe Thecostelinae, both in the Cymbidieae. According to Dressler little relation exists between *Acriopsis* and *Thecostele*. He considered *Acriopsis* to be related to the Cyrtopodiinae, however without being able to point out direct relationship to any particular genus in that subtribe.

Seidenfaden (1983) in his treatment of the Cymbidieae for Thailand did not express an opinion on the relationship of *Acriopsis* and *Thecostele*. He divided *Thecostele* in two related genera: *Thecostele* and *Thecopus*.

The genera *Acriopsis*, *Thecostele* and *Thecopus* all have a well developed tubular nectary. Another obvious character in common is the presence of two steldia near the apex of the column. The differences between the three genera, however, are quite large, especially between the first and the other two. *Acriopsis* has pseudobulbs which consist of several internodes; each node bears a scale except the two to four uppermost ones which bear a developed leaf. The other two have pseudobulbs consisting of one node bearing one leaf. In

Acriopsis the lateral sepals are connate throughout their length, forming a synsepalum, in *Thecostele* and *Thecopus* the lateral sepals are free. In *Acriopsis* the lip is more or less clearly divided in a hypochilium and an epichilium which are not divided by an articulation. The construction of the nectary is in *Acriopsis* quite different from that of the other two genera. It is formed by the fusion of the margins of the column with the margins of the base of the lip. In *Thecopus* and *Thecostele* the lip is also divided in a hypochilium and an epichilium, but here the epichilium is distinctly articulate and mobile. The entire hypochilium is connate to the column foot with which it forms the nectary which is here a tubular structure that projects in front of the base of the column. *Acriopsis* has a column hood which covers the anther, whereas the other two have a free anther. Further the pollinarium and the individual pollinia are quite different. In *Acriopsis* the stipes is long and narrow, with a small viscidium and two pairs of slender pollinia which are connate, of which the inner ones are often somewhat shorter and narrower. In *Thecostele* the pollinarium consists of two globose, slightly cleft pollinia on a minute, band-like stipes on a relatively large viscidium, and in *Thecopus* this organ consists of two pairs of two pollinia which are very unequal in shape and size, attached to a rather slender stipes without a viscidium.

These differences are in the opinion of the present authors sufficient to agree with Dressler (1979, 1981) that *Acriopsis* is probably better placed in a subtribe of its own. Possibly development studies of flower buds may throw more light on the nature and possible homologies of the structure of the nectary. A relation to the Cyrtopodiinae as suggested by Dressler is in our opinion not supported by the flower structure of the species of that group, as was revealed by revisional studies by Miss W. van der Burg (Rijksherbarium, Leiden; in preparation). Rather the affinities lie with the Thecostelinae.

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NOTES ON MORPHOLOGICAL CHARACTERS AND THEIR TAXONOMIC VALUE

Habit – The habit is more or less uniform throughout the genus. *Acropsis densiflora* is relatively small with short leaves and a short inflorescence. For height of the plant the length is taken between the top of the straightened inflorescence and the base of the rhizome.

Roots – The typical thick main attachment roots bear numerous thin, ascending, extensively branched catch-roots which catch litter. This feature is an important generic character.

Pseudobulbs – The pseudobulbs are crowded. They have up to 9 internodes, of which the middle ones form the major part of the pseudobulb. The bulbs are homoblastic: the terminal internodes bear developed leaves, the lower ones scales.

Leaves – *Acriopsis densiflora* can be distinguished by the short oblong leaf blades, in *A. ridleyi* the leaves are relatively narrow. Otherwise the leaves have little value in specific delimitation.

Inflorescence – The peduncle of the inflorescence is almost always relatively long. Unbranched racemes occur in *A. densiflora* and almost always in *A. ridleyi*. In the other species the inflorescence has one or more branches. In *A. carrii* the short branches spread stiffly.

Flowers – In this genus the flowers are rather uniform in size and general appearance. In *A. densiflora* the flowers are rather crowded, in the other species more or less widely spaced.

Perianth — The median sepal opposite to the connate lateral sepals (synsepalum) together with the two patent lateral petals render the flower its unique cross-shaped outline. Sepals and petals have uniform shapes throughout the genus. The upper sepal and the synsepalum are about similar, boatshaped, with curved tip. The petals are oblong to obovate, slightly concave.

Lip — The characters of the epichilium are of major taxonomic importance. In *A. javanica* it is 3-lobed with a narrow endlobe. In *A. densiflora*, *A. ridleyi* and *A. gracilis* it is pandurate with a more or less orbicular and narrow based endlobe. In *A. indica* and *A. carrii* the epichilium is not or hardly lobed. The epichilium is glabrous except in *A. javanica* var. *javanica* and var. *auriculata*, *A. ridleyi*, and *A. gracilis* where it is slightly pilose. The two short, fleshy keels on the endlobe are more or less connate in the centre and vary in size and position.

Column — The column is rather uniform throughout the genus. The two long stelidia vary in length and slenderness. The column hood varies in shape and size.

Anther — In the two-valved anther lies the pollinarium. The four pollinia are connate in two pairs, attached to a slender stipes (tegula sensu Rasmussen, 1982). Many authors wrongly record the presence of only two pollinia. In *A. javanica* var. *auriculata* the viscidium is relatively large.

Fruit — The globular to ellipsoid fruit opens with three valves. The seeds are situated between long hairlike structures. The embryo lies within a wing of inflated cells.

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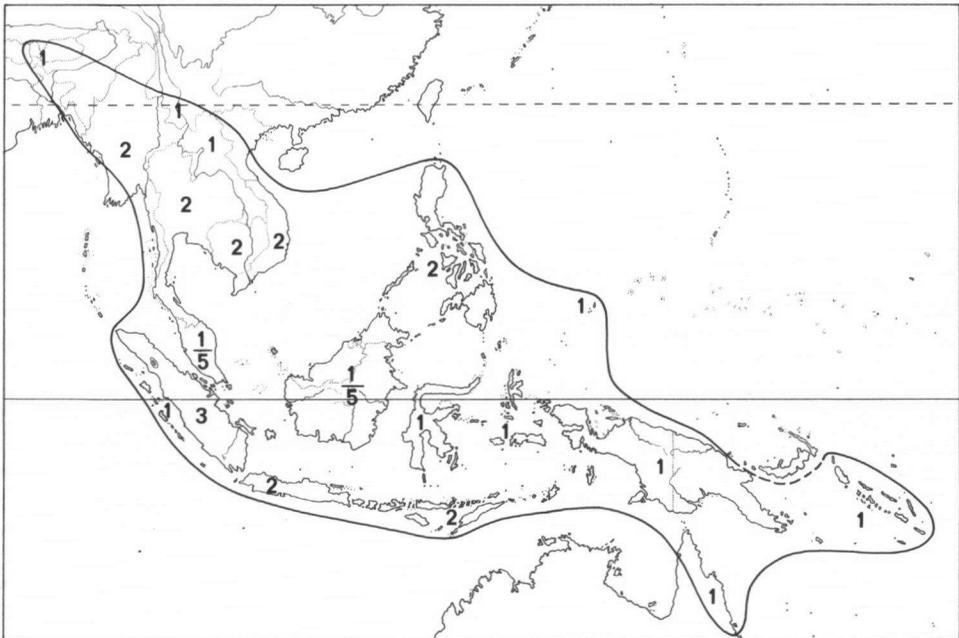
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ACRIOPSIS Reinw. ex Blume

Acriopsis Reinw. ex Blume, *Bijdr.* (1825) 376; *Cat.* (1823) 97, nom. nud.; Nees von Esenbeck, *Flora* VIII, 1 (1825) 102; Reinw., *Syll. Pl. Ratisb.* 2 (1825) 4; Lindley, *Gen. & Sp. Orch.* (1832) 140; Miq., *Fl. Ind. Bat.* 3 (1859) 709; Benth. & Hooker f., *Gen. Pl.* 3 (1883) 586; Pfitzer in E. & P., *Nat. Pfl. Fam.* 2 (1888) 181; Hooker f., *Fl. Brit. India* 6 (1890) 79; Grant, *Orch. Burma* (1895) 313; Schltr., *Oest. Bot. Zeitschr.* 50 (1900) 245; J. J. Smith, *Orch. Java* (1905) 537; Ridley, *Mat. Fl. Mal. Pen.* 1 (1907) 187; Schltr., *Orch.* (1915) 367; Ridley, *Fl. Mal. Pen.* 4 (1924) 189; Guill., *Fl. Gén. I.-C.* 6 (1933) 533; Mansfeld, *Notizbl. Bot. Gard. Mus. Berlin* 13 (1937) 666; Holttum, *Orch. Malaya* (1953) 550; Henderson, *Mal. Wild Fl. Mon.* (1954) 109; Dressler & Dodson, *Ann. Missouri Bot. Gard.* 47 (1960) 25; Seidenf. & Smitin., *Orch. Thail.* (1961) 514; Backer & Bakh. f., *Fl. Java* 3 (1968) 216; Dockrill, *Austr. Indig. Orch.* 1 (1969) 615; Pradhan, *Ind. Orch.* 1 (1976) 26; Dressler, *Orch. Nat. Hist. Class.* (1981) 257; Vaughan, *Orchadian* 6 (1981) 288. — Type species: *A. javanica* Reinw. ex Blume.

Sympodial epiphytes. Rhizome creeping, branched, the few internodes between the pseudobulbs short with some early eroding, amplexicaul, acute scales. Main roots stiff, fleshy, branched, bearing many thin, ascending, acute, extensively branched catch-roots. *Pseudobulbs* crowded, homoblastic, ovoid, shallowly sulcate; lowest internodes bearing thin, silvery papyraceous, acuminate to cuspidate scales clasping the entire bulb, upper internodes bear-

ing developed leaves. *Leaves* (1–)2–3(–4), articulate with the petiole, duplicative when young. Petiole sheath-like, clasping the bulb. Leaf blade oblong or linear, stiff herbaceous to subcoriaceous, multinerved; midrib sunken above, prominent below, the other nerves in fresh material not prominent. *Inflorescence* a raceme or a panicle, usually many-flowered, heteranthous, developing from the base of a pseudobulb on a short, rooting rhizome part with some amplexicaul, overlapping, ± triangular, acute scales. Peduncle relatively long, terete; internodes few, nodes with an amplexicaul, triangular, acute, membranous scale. Rhachis not zigzag; branches if present in the axil of a bract which resembles the peduncle scales. *Floral bracts* persistent, small, triangular, acute, membranous. *Flowers* more or less twisted but not resupinate, ± spirally arranged and irregularly spaced, widely open, cruciform. Pedicel slender, terete. *Sepals* 2, lanceolate, boat-shaped, apex curved to the front; the ventral one consisting of the fused lateral sepals, situated behind the lip (synsepalum). *Petals* spreading, oblong to obovate, about as long as the sepals or slightly shorter. *Lip* trilobed, pandurate or entire. *Hypochilium* basally with the margins adnate to the lower half of the column, forming a tube which is open in front, inside with a laterally adnate, ± decurved outgrowth forming an oblique plate with a small opening on the side of the hypochilium; front part of the hypochilium free, narrower than the epichilium. *Epichilium* patent, glabrous or slightly pubescent, bearing two short flattened keels which are centrally connate. *Column* ± straight or slightly S-curved, semi-orbicular in section, near the apex with two long, parallel, porrect or decurved long stelidia with ± swollen tips. *Stigma* between the stelidia ± narrowly elliptical in outline, flattened or with slightly elevated margins; rostellum beak-like or narrowly triangular, bifurcate, projecting above the stelidia. Anther two-valved, ± pear-shaped, covered by a large, wing-like hood. *Pollinarium* 1; stipes narrow, at the base provided with a small viscidium; pollinia 4, connate in two pairs, the inner two often shorter and narrower. Ovary slender, slightly conical, at a slight angle with the pedicel. *Fruit* globu-



Distribution map of the species of *Acriopsis*. A single number or a number below a hyphen indicates the total number of species in an area. The number above a hyphen indicates the number of endemics.

lar to ellipsoid to obovoid, opening with 3 valves, the column and often the perianth parts persistent. *Seeds* situated between long hairs, \pm fusiform, c. 0.1 mm long, tips acute; embryo surrounded by a wing of inflated cells.

Distribution. Sikkim, Burma, Thailand, Laos, ?Cambodia, Vietnam, Malay Peninsula, all over Indonesia, the Philippines, New Guinea, Palau Islands, Solomon Islands, Louisiade Islands, and Australia.

Ecology. Epiphytes in primary and secondary forest, coastal swamp forest, on trees in savannahs, sometimes recorded growing in ants' nests in trees; altitude 0–c. 1700 m.

KEY TO THE SPECIES OF ACRIOPSIS

- 1 a. Basal panicle scales and peduncle scales appressed 2
- b. Basal panicle scales and peduncle scales inflated. – Lip entire, centrally only slightly constricted 1. *A. carrii*
- 2 a. Leaves linear to narrowly linear 3
- b. Leaves oblong 2. *A. densiflora*
- 3 a. Lip entire to slightly pandurate 4. *A. indica*
- b. Lip distinctly 3-lobed 4
- 4 a. Sidelobes of lip bent backwards; keels reclining 3. *A. gracilis*
- b. Sidelobes of lip spreading; keels erect or bent forwards 5
- 5 a. Endlobe of lip \pm as broad as or broader than the width over the sidelobes 6. *A. ridleyi*
- b. Endlobe of lip less than half as broad as the width over the sidelobes 5. *A. javanica*

1. *Acriopsis carrii* Holttum – Fig. 2.

Acriopsis carrii Holttum, Gard. Bull. Sing. 11 (1947) 275; Orch. Malaya (1953) 551. – Type: Carr 135, Kelantan, Malay Peninsula (SING).

Plants entirely glabrous, 32–42 cm high. Main roots 2–4.5 mm diam., catch-roots not seen. Rhizome 4.5–7 mm diam., between the pseudobulbs with c. 3 internodes 2.5–5 mm long; scales c. 7.5 mm long; pseudobulb scales 2–3, 2.7–5.8 cm long. *Pseudobulbs* c. 0.5–1.5 cm apart, 2–4.5 by c. 1 cm, with 5–6 internodes. *Leaves* 3 per pseudobulb; petiole 9–15 mm long; blade linear, 18–32 cm by 6–9.5 mm, apex acute. *Panicle* c. 100–140-flowered, slightly drooping, 23–41 cm long; basal scales 2–4, inflated, 9–16 mm long; peduncle 13–22 cm long, 1.3–2.5 mm diam., with 2–3 internodes; peduncle scales inflated, 9–14 mm long; rhachis 11–20 cm long; branches 7–13, stiffly spreading from the rhachis, 3–13 cm long. *Floral bracts* 1–2 by 1–15 mm. *Flowers* 2–11 mm apart, 8–11 mm diam. Pedicel 5–8 mm long, 0.3–0.6 mm diam. *Median sepal* 5.1–5.3 by 1–1.7 mm, apex subacute, nerves 3. *Synsepalum* 5.1–5.3 by 1.3–1.8 mm, apex obtuse, nerves 2 or 4. *Petals* obovate, 4.2–4.9 by 1.8–2.1 mm, apex obtuse, nerves 3. *Lip* entire. *Hypochilium*: adnate part c. 1.5 mm long, centrally slightly constricted, basal outgrowth c. 0.5 mm up the column, 0.9 mm long, deflexed; free part narrowed, \pm canaliculate, c. 1.2 by 0.5 mm, apically constricted. *Epichilium* entire, oblong, 2.3–2.6 by 0.8–1 mm, centrally slightly constricted, apex emarginate, deflexed; keels on the upper half of the epichilium, erect, 1 by 0.5 mm, tips broadly rounded. *Column* straight, 3.1–3.3 mm long, rather stout; stelidia 1.1–1.6 mm long, 0.2 mm diam., tips slightly swollen; hood large, straight, 1.9–2 mm long, top margin widened and reflexed. *Stigma* elliptical in outline, flattened; rostellum beak-like, 1.2–1.6 mm long. Anther narrowly pear-shaped, 0.6–0.8 by 0.3 by 0.3 mm. *Pollinia* oblong, the inner two narrower, 0.6 by 0.2 mm; stipes c. 0.9 mm long; viscidium c. 0.1 mm diam. Ovary 2.5–4 mm long. *Fruit* \pm globular, 5–5.5 by 5 mm.

Distribution. Malay Peninsula (Kelantan).

Ecology. Epiphytes on ferns on trees overhanging a stream; altitude c. 140 m. Fl. fr. Febr., Aug., Oct.

Collectors' notes. Perianth yellowish, lip white, column green; hood and stelia whitish, rostellum yellow-green, pedicel and ovary pale green.

2. *Acriopsis densiflora* Lindley

For literature, see under the varieties.

Plants entirely glabrous, 11–19 cm high. Main roots 0.5–4.5 mm diam., catch-roots 0.2–0.8 mm diam. Rhizome 2–4 mm diam., between the pseudobulbs with c. 3 internodes c. 2–3 mm long; scales 5–6 mm long; pseudobulb scales c. 3, 0.6–2 cm long. *Pseudobulbs* 1–1.5 cm apart, 1.4–2.5 by c. 0.7–1 cm, with c. 5 internodes. *Leaves* 2(–3) per pseudobulb; petiole 2–4 mm long; blade oblong, 1.3–6.5 by 0.5–1.4 cm, apex obtuse. *Inflorescence* simple, 15–29-flowered, erect, 10–16.5 cm long; basal scales appressed, 3–4, 4–6 mm long; peduncle 3.5–9.5 cm long, 1–1.5 mm diam., with 2–3 internodes; peduncle scales appressed, 3–5 mm long; rhachis 4–8 cm long. *Floral bracts* 1–1.5 by 0.5 or 0.9 mm. *Flowers* crowded, 1–6 mm apart, 9–11 or 11.5–14 mm diam. Pedicel 5.5–7 mm long, 0.2–0.3 mm diam. *Median sepal* 5.8–7.7 by 1.5–2.7 mm, apex acute, nerves 3. *Synsepalum* 5.7–8.1 by 2–3.2 mm, apex obtuse, nerves 4 or 5. *Petals* obovate, 4.6–6.5 by 2–3.5 mm, apex rounded, nerves 3 or 5. *Lip* 3-lobed, panduriform. *Hypochilium*: adnate part 1.8–2.4 mm long, centrally constricted, basal outgrowth c. 0.5–0.6 mm up the column, 0.7–0.9 mm long, deflexed; free part narrowed or narrowly linear, ± canaliculate or semi-orbicular, 0.9–1.2 or 2.4–2.8 by 0.3 mm. *Epichilium* 4–5.2 by 2.1–2.4 or 2.8–3.2 mm; side-lobes oblong to triangular, spreading or slightly deflexed, 1 or 1.2 by 0.6–0.8 mm, tips acute; endlobe broadly spathulate, basal part narrow, 0.7–1 by 0.5(–1.5) mm, apical part ± orbicular, 2.1–2.4 by 2.3–2.7 mm, concave, apex rounded; keels on the base of the endlobe, ± triangular or ± rectangular and centrally constricted, erect, c. 0.6 or 1–1.1 by c. 0.5 or 0.9–1 mm, tips rounded or truncate to retuse. *Column* ± straight, 4–5.5 mm long; stelia 1.5–1.8 or 2.3–2.7 mm long, c. 0.3 mm diam., tips swollen or flattened sideways; hood 1.3–1.9 mm long, widening towards the apex, top margin entire, straight or reflexed. *Stigma* ± elliptical in outline, flattened; rostellum beak-like or narrowly triangular to subulate, 1–1.2 or 1.6–1.8 mm long. Anther narrowly pear-shaped, 0.6–0.8 by 0.3 by 0.3–0.4 mm. *Pollinia* oblong, flattened, the inner two narrower, 0.7–0.9 by 0.2 mm, tips subacute; stipes 1.1 or 1.6–1.9 mm long; viscidium 0.1–0.3 by c. 0.1–0.2 mm. Ovary 2.5–3.5 mm long. *Fruit* ellipsoid, 0.8–1.1 by 1.3–1.5 cm.

KEY TO THE VARIETIES OF *ACRIOPSIS DENSIFLORA*

- 1 a. Free part of hypochilium 0.9–1.2 mm long; stelia 1.5–1.8 mm long; keels ± triangular with rounded tip a. var. *densiflora*
- b. Free part of hypochilium 2.4–2.8 mm long; stelia 2.3–2.7 mm long; keels ± rectangular, with truncate to retuse tip b. var. *borneensis*

a. var. *densiflora* — Fig. 3 a–e.

Acriopsis densiflora Lindley, Bot. Reg. 33 (1847) sub t. 20; Rchb. f. in Walp., Ann. 6 (1864) 492; Schltr., Oest. Bot. Zeitschr. 50 (1900) 249, 289; J.J. Smith, Bull. Jard. Bot. Btzg III, 1 (1919) 120; Ames in

Merr., Enum. Born. (1921) 193; J.J. Smith in Fedde, Rep. 32 (1933) 348; Holttum, Orch. Malaya (1953) 551. — Type: Low s.n., from Borneo (not seen).

Acriopsis purpurea Ridley, Trans. Linn. Soc. Bot. II, 3 (1893) 406; J. Linn. Soc. Bot. 31 (1896) 299; *ibid.* 32 (1896) 384; Mat. Fl. Mal. Pen. 1 (1907) 187; Ames in Merr., Enum. Born. (1921) 193; Ridley, Fl. Mal. Pen. 4 (1924) 190. — Type: Ridley s.n., from Pekan, Malay Peninsula (SING). Reduced to *A. densiflora* by Schltr., Oest. Bot. Zeitschr. 50 (1900) 289.

Main roots 1–4.5 mm diam., catch-roots 0.2–0.5 mm diam. Pseudobulb scales 0.6–2 cm long. *Leaves*: blade 1.3–6.5 cm long. *Inflorescence* 15–28-flowered. Peduncle scales 3–5 cm long. *Floral bracts* c. 0.5 mm wide. *Flowers* 9–11 mm diam. Pedicel 6.5–6.7 mm long. *Median sepal* 1.5–2 mm wide. *Synsepalum* 5.7–6.5 by 2–2.3 mm. *Petals* 4.6–5.6 by 2–2.6 mm. *Hypochilium*: adnate part 2.1–2.4 mm long; free part narrowed, ± canaliculate, 0.9–1.2 mm long. *Epichilium* 4.5–5.2 by 2.1–2.4 mm; sidelobes triangular, spreading, c. 1 mm long; endlobe: basal part c. 0.7 mm long; keels ± triangular, 0.6 by 0.5 mm, tips rounded. *Column* to 4.9 mm long; stelidia 1.5–1.8 mm long, tips swollen; hood to 1.6 mm long, top margin reflexed. Rostellum beak-like, 1–1.2 mm long. Stipes 1.1 mm long.

Distribution. Malay Peninsula (Pahang); Sumatra (Sumatera Barat); Borneo: Brunei, Sarawak.

Ecology. In Sumatra at c. 400 m altitude (no other recordings). Fl. fr. March, May.

Collector's notes. Perianth tinged dark red or brown, sometimes with yellow-green edges (fide Holttum, 1953). Lip white with a pink centre. Fruits green.

Note. In the two collections from Sumatra (Van der Est s.n. and Horst s.n.) the lip has a broadly based endlobe to 1.5 mm wide.

b. var. borneensis (Ridley) Minderhoud & de Vogel, *comb. nov.* — Fig. 3f, g.

Acriopsis borneensis Ridley, J. Str. Br. R. As. Soc. 44 (1905) 193; Ames in Merr., Enum. Born. (1921) 193. — Type: Ridley s.n., from Sarawak (SING).

Main roots 0.5–2.5 mm diam., catch-roots 0.2–0.8 mm diam. Pseudobulb scales 0.6–1.4 cm long. *Leaves*: blade 2.2–4 cm long. *Inflorescence* 26–29-flowered. Peduncle scales 3–3.5 cm long. *Floral bracts* c. 0.9 mm wide. *Flowers* 11.5–14 mm diam. Pedicel 5.5–7 mm long. *Median sepal* 1.6–2.7 mm wide. *Synsepalum* 6.1–8.1 by 2–3.2 mm. *Petals* 5.3–6.5 by 2.2–3.5 mm. *Hypochilium*: adnate part 1.8–2 mm long; free part narrowly linear, ± semi-orbicular in section, 2.4–2.8 mm long. *Epichilium* 4–4.6 by 2.8–3.2 mm; sidelobes oblong, slightly deflexed, c. 1.2 mm long; endlobe: basal part 0.8–1 mm long; keels ± rectangular, centrally constricted, 1–1.1 by 0.9–1 mm, tips truncate to retuse. *Column* to 5.1–5.5 mm long; stelidia 2.3–2.7 mm long, tips slightly decurved, flattened sideways; hood 1.6–1.9 mm long, top margin about straight. Rostellum narrowly triangular to subulate, 1.6–1.8 mm long. Stipes 1.6–1.9 mm long.

Distribution. Borneo: Sabah (Interior Residency), Sarawak (1st Division).

Ecology. Epiphytes in podsol forest in light shading, altitude 200–500 m. Fl. June, Sept.

Note. Collenette 27/29 has greenish white flowers with reddish spots. Lip white flushed with lilac. The scent is sweet azalea-like. Lamb s.n. has flowers with a yellowish green perianth with purplish spots. Lip white with a large violet blotch on the base of the epichilium and the keels. Column violet, the tips of the stelidia greenish ochre, top margin of the hood white.

3. *Acriopsis gracilis* Minderhoud & de Vogel, *spec. nov.* — Fig. 4; Plate 1a.

Pseudobulbi bi-vel trifoliolati. Flores ca. 15 mm diam. Sepalum medianum ca. 7.8 mm longum, 2.6 mm latum. Synsepalum ca. 8.3 mm longum, 3.1 mm latum. Petala ca. 7.9 mm longa, 3.5 mm lata. Label-

lum panduriforme. Hypochilii pars adnata centraliter constricta, appendiculo basali ca. 10 mm longo, pars libera anguste linearis patens, apicaliter duos tuberculos gerens. Epichilium S-curvatum, lobis lateralibus reflexis pilosis, lobo terminali late spatulato, parte apicali semi-orbiculari, carinis reclinatis. Stelidia 2–6 mm longa. Clinandrium 2.6–2.8 mm longum. Stipes ca. 2.2 mm longus. – *T y p u s*: *Lamb s. n.*, Sook, Sabah.

Plants entirely glabrous except the lip pilose. Sterile specimen 32 cm high. Main roots 1.5–3 mm diam., catch-roots not seen. Rhizome 3.5–5 mm diam, between the pseudobulbs with c. 3 internodes, c. 2.5–3 mm long; scales to c. 2 cm long, often eroded. Pseudobulb scales c. 3, 2.5–4 cm long. *Pseudobulbs* c. 1 cm apart, 2.5–3 by c. 1 cm, with c. 4 internodes. *Leaves* 2 or 3 per pseudobulb; petiole 3–6 mm long; blade linear, 15.5–23.5 by 0.5–0.7 cm, apex obtuse. Only apical part of the inflorescence present, 11.6 cm long, 1.4 mm diam. *Floral bracts* 1.2 by 1 mm. *Flowers* c. 25, 2–13 mm apart, c. 15 mm diam. Pedicel c. 8 mm long, 0.6 mm diam. *Median sepal* c. 7.8 by 2.6 mm; apex acute; nerves 3. *Synsepalum* c. 8.3 by 3.1 mm; apex obtuse; nerves 5. *Petals* obovate, 7.9 by 3.5 mm; apex rounded; nerves 5. *Lip* 3-lobed, ± panduriform. *Hypochilium*: adnate part 2.5 mm long, centrally constricted, apically widened; basal outgrowth c. 0.9 mm up the column, c. 1 mm long, deflexed; free part narrowly linear, patent, ± semi-orbicular in diam., 2.5 by 0.4 mm, apically with two little knobs. *Epichilium* S-curved, 4.6 by 3.8 mm; sidelobes obliquely obovate, 1.6 by 1.4 mm, reflexed, tips rounded, pilose with hairs 0.05–0.1 mm long; end-lobe broadly spatulate, basal part narrowed, 2 by 0.5 mm, margin with hairs to 0.5 mm long, apical part ± semi-orbicular, 2.2 by 3.6 mm, centrally convex, near the margin concave, apex emarginate, at the base with some hairs to 0.2 mm long; keels on the base of the endlobe, reclined, 1.2 by 1 mm, tips ± rounded. *Column* S-curved, 4 mm long; stelidia 2.6 mm long, 0.2 mm diam., tips slightly swollen, decurved; hood 2.6–2.8 mm long, top margin entire, reflexed. *Stigma* elliptical in outline, slightly elevated; rostellum subulate, 2–2.1 mm long. Anther narrowly pear-shaped, 1.2 by 0.5 by 0.3 mm; pollinia elongate, the inner two narrower, 0.9 by 0.2 mm, tips acute; stipes 2.2 mm long; viscidium c. 0.1 mm diam. Ovary 4 mm long. *Fruit* not seen.

Distribution. Borneo: Sabah.

Ecology. Not known; altitude between 300 and 600 m.

Collector's notes. Sepals and petals are greenish, spotted purple. Lip white, epichilium centrally violet. Column pale green, at the back with a purple blotch, base of hood and stelidia purplish red, tips of the stelidia greenish ochre. Anther pale yellowish.

Note. The only collection consist of a sterile specimen and an apical part of the rhachis or a branch. Therefore it is not clear whether this species has a simple or a branched inflorescence.

4. *Acriopsis indica* Wight – Fig. 5; Plate 1b.

Acriopsis indica Wight, Ic. 5 (1852) 20, t. 1748-1; Rchb. f. in Walp., Ann. 6 (1864) 492; Gard. Chron. 1 (1881) 656; Hooker f., Fl. Brit. India 6 (1890) 79; Ridley, J. Linn. Soc. Bot. 32 (1896) 384; Grant, Orch. Burma (1895) 313; Schltr., Oest. Bot. Zeitschr. 50 (1900) 249, 287; J.J. Smith, Orch. Java (1905) 539; Ridley, Mat. Fl. Mal. Pen. 1 (1907) 188; Finet, Not. Syst. 1 (1909) 260; Koord., Exk. Fl. Java 1 (1911) 399; Hosseus, Beih. Bot. Centralbl. 28, 2 (1911) 375; J.J. Smith, Orch. Java Fig. Atlas (1912) f. 411; Ames, Orch. 6 (1920) 215, 307; Ridley, Fl. Mal. Pen. 4 (1924) 190; Ames in Merr., Enum. Philip. 1 (1925) 398; Guill., Fl. Gén. I.-C. 6 (1933) 533; Not. Syst. 14 (1951) 129; Holttum, Orch. Malaya (1953) 553; Guill., Bull. Mus. Hist. Nat. Paris 26 (1954) 541; *ibid.* 30 (1958) 303; Seidenf. & Smitin., Orch. Thail. (1961) 514, f. 380; *ibid.* (1964) 818, f. 614; Backer & Bakh. f., Fl. Java 3 (1968) 398; Kerr, Nat. Hist. Bull. Siam Soc. 23 (1969) 203; Seidenf., Bull. Mus. Hist. Nat. Paris 71 (1972) 105; Pham-Hoang, Cáy-Cò Miên-Nam 2, ed. 2 (1972) 1085, f. 5223; Malh. & Deori, Bull. Bot. Surv. India 15 (1973) 151, f. 1–8; Seidenf., Contr. Rev. Orch. Fl. Camb. (1975) 5; Opera Botanica 72 (1983) 103, f. 57, pl. VIIIa; C. Singchi & T. Zhanhue, Acta Bot. Yunnanica 6 (1984) 267, f. 1,

1-3. - Type: probably Griffith or Griffith & Parish (see note; not seen, probably lost). Neotype: Parish 76 (K), from Moulmain, Burma.

Plants entirely glabrous except the lip sometimes somewhat hairy, 11-46 cm high. Main roots 1-3 mm diam., catch-roots 0.2-1 mm diam. Rhizome 2-3.5 mm diam., between the pseudobulbs with c. 3 internodes 2-3 mm long; scales to 13 mm long. Pseudobulb scales 3-4, 1.5-3.5 cm long. *Pseudobulbs* 0.5-2 cm apart, 1-3 by 0.6-1.7 cm, with 5-8 internodes. *Leaves* 2-3(-4) per pseudobulb; petiole 5-13 mm long; blade linear, 4-16 cm by 1.5-6 mm, apex subacute to broadly acuminate. *Panicle* 17-150-flowered, ± erect or slightly drooping, 11-38 cm long, curved at the tip; basal scales appressed, 3-4, 6-15 mm long; peduncle 5-16 cm long, 0.5-2 mm diam., with 2-3 internodes; peduncle scales appressed, 3-5.5 mm long; rachis 6-22 cm long; branches ascending, 0-8, c. 7-11 cm long, sometimes with secondary branches. *Floral bracts* 0.5-2.5 by 0.3-0.8 mm. *Flowers* 0.4-2 cm apart, 7-10 mm diam. Pedicel 4-6 mm long, c. 0.3 mm diam. *Median sepal* 3.8-4.8 by 1.2-1.3 mm, apex acute, nerves 3. *Synsepalum* 3.6-4.6 by 1.4-1.7 mm, apex obtuse, nerves 2 or 4. *Petals* narrowly obovate, 3.6-4.2 by 1.2-1.7 mm, apex broadly rounded, nerves 3. *Lip* entire. *Hypochilium*: adnate part c. 1.5-2 mm long, centrally constricted; basal outgrowth c. 0.7 mm up the column, 0.4-1 mm long, deflexed; free part narrowed, ± canaliculate, c. 1-1.4 by 0.6 mm. *Epichilium* entire, ovate to slightly pandurate, 3.4-3.7 by 1.5-2.4 mm, from base to keels in the centre swollen, margin undulate, apex rounded, sometimes emarginate, deflexed, sometimes with very short hairs; keels ± halfway the epichilium, erect, 0.5-0.6 by 0.4 mm, tips rounded to truncate. *Column* ± straight, 2.7-3 mm long; stelia c. 0.9 mm long, 0.1 mm diam., tips swollen, curved towards each other; hood straight, 1-1.7 mm long, top margin slightly emarginate, reflexed. *Stigma* elliptical in outline, elevated; rostellum beak-like, 0.6-1.1 mm long. Anther pear-shaped, c. 0.5 mm long. *Pollinia* slightly falcate, flattened, 0.6 by c. 0.1 mm, tips obtuse; stipes c. 0.5 mm long; viscidium c. 0.05 mm diam. Ovary 2.3-2.5 mm long. *Fruit* ellipsoid to globular, 0.7-1.4 by 0.5-0.7 mm.

Distribution. ?India (Assam); Burma (Tenasserim); Thailand; Laos; ?Cambodia; Vietnam; Malay Peninsula; Java; Borneo: Sabah (West Coast Residency), Kalimantan; Lesser Sunda Islands (Timor); Philippines (Mindanao, ?Luzon).

Ecology. In primary forest, deciduous forest, tea plantations; altitude 200-1700 m. Fl. May, June; fr. March, Oct.

Collector's notes. Sepals and petals greenish yellow with several faint purple or greenish or brown blotches on the back of the midribs or one blotch near the apex; when older the perianth may turn pink. Lip white to greenish.

Note. The type specimen which Wight depicted in Ic. 5 (1852) t. 1748-1 is probably lost. Most likely Wight received it from Griffith (Hooker f., 1890) or from Griffith & Parish (Rchb. f., 1881); the specimen was probably collected in Moulmein, Burma (Malhotra, 1973). The drawing is of insufficient quality, so we refrained from selecting this as the lectotype.

5. *Acriopsis javanica* Reinw. ex Blume

For literature, see under the varieties.

Plants entirely glabrous except the lip sometimes somewhat hairy, 16-115 cm high. Main roots 1-3.5 mm diam., catch-roots 0.3-1.5 mm diam. Rhizome 2-6 mm diam., between the pseudobulbs with 3-5 internodes 2-7 mm long; scales 0.5-1 cm long, often eroded. Pseudobulb scales 3-4, 1.5-7 cm long. *Pseudobulbs* 0.5-2.5 cm apart, 1.3-6 by 1-3 cm, with 5-8 internodes. *Leaves* (2-)3-4 per pseudobulb; petiole 1.5-25 mm long; blade linear, 5-32 by 0.3-2 cm, apex acute to obtuse, sometimes with a small acumen. *Panicle*

12–300-flowered, erect or drooping, 16–115 cm long, curved at the tip; basal scales appressed, 3–5, 4–19 mm long; peduncle 8.5–59 cm long, 1–3.5 mm diam., with 2–4 internodes; peduncle scales appressed, 4–16 mm long; rhachis 8–65 cm long; branches 0–7, to 54 cm long, sometimes with secondary or tertiary branches. *Floral bracts* 1–3 by 0.5–1.5 mm. *Flowers* 2–40 mm apart, 8–14 mm diam. Pedicel 3–6.4 mm long, c. 0.4 mm diam. *Median sepal* 4.7–7.2 by 1–2.8 mm; apex acute, nerves 3. *Synsepalum* 4.5–7.2 by 1.4–3.2 mm; apex obtuse; nerves 2 or 4–6. *Petals* oblong to obovate, 4.3–6.8 by 1.3–3 mm; apex rounded; nerves 3 or 5. *Lip* 3-lobed. *Hypochilium*: adnate part 2.1–3 mm long, slightly or much inflated, centrally constricted; basal outgrowth c. 0.4–1 mm up the column, 0.5–1.7 mm long, patent to deflexed; free part narrowed, \pm canaliculate, 0.5–1.7 by 0.8–1.5 mm, apically either or not with two marginal auricles. *Epichilium* 3.6–6.2 by 2–5 mm, from base to keel centrally slightly swollen; sidelobes obovate, triangular or obliquely rectangular, spreading or bent forwards, 0.6–2 by 0.7–2.2 mm, slightly convex, tips rounded to obtuse, glabrous or sometimes with very short hairs; endlobe obovate with a broad base, narrowly spatulate to ligulate, 1.4–3.8 by 0.6–1.4 mm, apex rounded to slightly emarginate, deflexed, glabrous or with hairs to 0.2 mm long; keels on the base of or halfway the endlobe, erect to ascending, 0.5–1.2 by 0.4–0.7 mm, tips rounded to truncate, sometimes slightly papillose. *Column* \pm straight or slightly curved, 3.8–6 mm long; steldia 0.9–1.8 mm long, 0.3–0.5 mm diam., tips swollen or flattened sideways, decurved or curved towards each other; hood straight or centrally constricted, 0.9–1.5 mm long, top margin entire, emarginate or slightly crenulate and reflexed. *Stigma* elliptical in outline, sometimes slightly elevated; rostellum beak-like or narrowly triangular, 0.9–1.3 mm long. Anther \pm pear-shaped, 0.6–1 by 0.3–0.4 by 0.3–0.5 mm. *Pollinia* \pm falcate and flattened or obovoid, the inner two narrower or equally sized, 0.6–0.9 by 0.1–0.3 mm; tips rounded to acute; stipes 0.5–1 mm long; viscidium \pm ovate, 0.1–0.3 by 0.1–0.2 mm. Ovary 2–3.5 mm long. *Fruit* globular, ellipsoid or obovoid, 0.9–2.4 by 0.8–1 cm.

KEY TO THE VARIETIES OF ACRIOPSIS JAVANICA

- 1 a. Margins of the hypochilium not ending into an auricle 2
- b. Margins of the hypochilium each ending in front into a small auricle. – Epichilium: sidelobes 1.4–1.5 by 1.3–1.4 mm, endlobe narrowly spatulate, 2.1–3 by 0.6–1.4 mm c. var. *auriculata*
- 2 a. Sidelobes of the epichilium 1–2 by 1.4–2.2 mm. Endlobe obovate with a broad base to spatulate, 1.4–3.1 by 0.6–1.2 mm. Keels \pm on the base of the endlobe a. var. *javanica*
- b. Sidelobes of the epichilium 0.6–0.9 by 0.7–1.2 mm. Endlobe slender, ligulate, 2.6–3.8 by 0.8–0.9 mm. Keels \pm halfway the endlobe b. var. *floribunda*

a. var. *javanica* – Fig. 1 a–c, f–h; Plate 1c, d.

Acriopsis javanica Reinw. ex Blume, Bijdr. (1825) 377; Cat. (1823) 97, nom. nud.; Nees von Esenbeck, Flora VIII, 1 (1825) 102; Reinw., Syll. Pl. Ratisb. 2 (1825) 4; Lindley, Gen. & Sp. Orch. (1832) 140; de Vriese, Ill. Orch. (1854) t. 4 acc. fig.; Rchb. f., Bonplandia 5 (1857) 37; Miq., Fl. Ind. Bat. 3 (1859) 709; Rchb. f. in Walp., Ann. 6 (1863) 492; Hooker f., Fl. Brit. India 6 (1890) 79; Grant, Orch. Burma (1895) 313; Ridley, J. Linn. Soc. Bot. 32 (1896) 384; Koord., Minah. (1898) 32; Schltr., Oest. Bot. Zeitschr. 50 (1900) 249, 286; Kraenzlin in K. Sch. & Laut., Fl. Schutzgeb. (1900) 250; J.J. Smith, Orch. Java (1905) 537; Ridley, Mat. Fl. Mal. Pen. 1 (1907) 187; J. Linn. Soc. Bot. 38 (1908) 330; J.J. Smith, Nova Guinea VIII, 1 (1909) 119; Koord., Exk. Fl. Java 1 (1911) 399; Schltr., Beibl. Bot. Jahrb. 45 (1911) 104; J.J. Smith, Nova Guinea VIII, 3 (1911) 604; Orch. Java Fig.-Atlas (1912) f. 410; Nova Guinea 12 (1914) 455; Schltr., Orch. (1915) 368; J.J. Smith, Bull. Jard. Bot. Btzg III, 1 (1919)

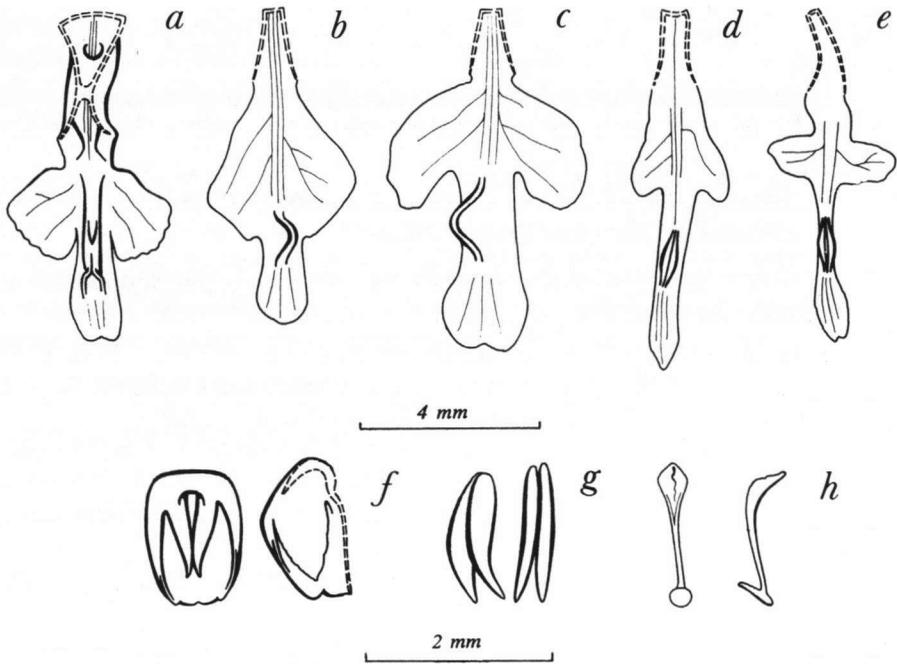


Fig. 1. *Acriopsis javanica* Reinw. ex Blume var. *javanica*. a–c. Lip; f. anther; g. pollinia; h. stipes and viscidium. — *A. javanica* var. *floribunda* (Ames) Minderhoud & de Vogel. d, e. Lip (a, f–h. Seidenfaden & Smitinand 6195b; b. Fleischer s.n.; c. Edinburgh, cult. Hort. C5524; d. BS 35112; e. Cuming 2067).

- 120; Ames in Merr., Enum. Born. (1921) 193; Schltr., Bot. Jahrb. 56 (1921) 491; Ridley, Fl. Mal. Pen. 4 (1924) 190; Ames in Merr., Enum. Philip. 1 (1925) 398; Schltr. in Fedde, Rep. 21 (1925) 198; Docters v. Leeuwen, Trop. Natuur 18 (1929) 133, f. 3, 12, 13, 16a; Merr., Pl. Elm. Born. (1929) 39; J.J. Smith in Fedde, Rep. 32 (1933) 349; Guill., Fl. Gén. I.-C. 6 (1933) 533; Latif, De Orch. III, 11 (1934) 293; Carr, Gard. Bull. Str. Settl. 8 (1935) 121; Holttum, Orch. Malaya (1953) 551; Henderson, Mal. Wild Fl. Mon. (1954) 110; Seidenf. & Smitin., Orch. Thail. (1961) 514, f. 379; *ibid.* (1964) 818; Backer & Bakh. f., Fl. Java 3 (1968) 398; Seidenf., Bull. Mus. Hist. Nat. Paris 71 (1972) 105; Bodegom, Orch. W. New Guinea (1973) 175, phot.; Seidenf., Contr. Rev. Orch. Fl. Camb. (1975) 5; Millar, Orch. Papua New Guinea (1978) 63, phot.; Seidenf., Opera Botanica 72 (1983) 104, f. 58, pl. VIIIb. — *Syn* types: Blume s.n., from Mt Salak, Java: HLB 902-322-65 (lecto L, here proposed), -66, -67, -68. *Spathoglottis ?trivalvis* Lindley, Gen. & Sp. Orch. (1832) 120; Wall., Cat. (1831) n. 3742, nom. nud. — *Type*: Wallich 3742 from Singapore (seen on microfiche). Reduced to *A. javanica* by Hooker f., Fl. Brit. India 6 (1890) 79.
- ?*Acriopsis picta* Lindley, Bot. Reg. 29 (1843) misc. 69. — *Type*: Papeleu s.n., from Bantam, Java (not seen). Reduced to *A. javanica* by Rchb. f. in Walp., Ann. 6 (1864) 492.
- Acriopsis griffithii* Rchb. f., Bonplandia 2 (1854) 92; in Walp., Ann. 6 (1864) 492. — *Type*: Griff., Ic. Pl. As. 3 (1851) t. 318; it was described as *Acriopsis spec.* in Griff., Not. 3 (1851) 333, after Griffith s.n. (W) from Malacca (not seen, probably lost). Reduced to *A. javanica* by Hooker f., Fl. Brit. India 6 (1890) 79.
- Acriopsis nelsoniana* Bailey, Queensl. Agr. J. 3 (1898) 7; Schltr. in Fedde, Rep. Beih. 1 (1914) 950; *ibid.* 21 (1928) t. 335-1293. — *Acriopsis javanica* Reinw. ex Blume var. *nelsoniana* (Bailey) J.J. Smith, Nova Guinea 14 (1929) 492; Bull. Jard. Bot. Btzg III, 1 (1919) 120, nom. nud.; Nova Guinea 18 (1935) 71; Dockrill, Austr. Indig. Orch. 1 (1969) 616, f. A–L; Bedf., Nat. Austr. Orch. (1969) 1; Millar, Orch. Papua New Guinea (1978) 63; Vaughan, Orchadian 6 (1981) 288. — *Type*: from Gira River, New Guinea (collector unknown; not seen).
- ?*Acriopsis sumatrana* Schltr., Oest. Bot. Zeitschr. 50 (1900) 249. — *Type*: Fr. Krause s.n., from Bindjei in the province of Deli, Sumatra (see note 3; not seen, probably lost).

- Acriopsis papuana* Kraenzlin in K. Sch. & Laut., Fl. Schutzgeb. (1900) 250, nom. nud. — Type: Lauterbach 1466 (B), from Finschhafen, New Guinea. Reduced to *A. javanica* by Schltr., Oest. Bot. Zeitschr. 50 (1900) 287.
- Acriopsis philippinensis* Ames, Orch. 2 (1908) 215, fig. — Syn types: Williams 2778, Clemens s.n. (Nov. 1906) and 218 (all not seen). Reduced to *A. javanica* by Ames in Merr., Enum. Philip. 1 (1925) 399.
- Acriopsis nelsoniana* Bailey var. *pallidiflora* Schltr. in Fedde, Rep. Beih. 1 (1914) 950. — Type: Schlechter 19564, from Warea, New Guinea (not seen).
- ?*Acriopsis insulari-sylvatica* Fukuyama, Trans. Nat. Hist. Soc. Formosa 28 (1938) 3. — Type: Kanehira 563, from Babaltaob, Palau Islands (see note 4; not seen).
- ?*Acriopsis harai* Tuyama, J. Jap. Bot. 39 (1964) 129, f. 1, pl. 3; Fl. E. Himalaya (1966) 424; Pradhan, Ind. Orch. 2 (1979) 717, fig. — Type: Hara s.n. (?TI), from the vicinity of Gangtok, Sikkim (see note 5; not seen).

Pseudobulbs: internodes 5–7. *Leaves*: petiole 15–25 mm long; blade 5–28 cm by 3–20 mm. *Panicle* 12–c. 200-flowered, to 90 cm long; basal scales 4–17 mm long; peduncle 8.5–55 cm long; rhachis 8–38 cm long; branches 0–7, to 25 cm long, sometimes with secondary branches. *Floral bracts* 1.5–3 mm long. *Synsepalum* 4.5–6.5 mm long, nerves 4–6. *Petals* 1.5–3 mm wide. *Hypochilium*: adnate part sometimes slightly inflated, basal outgrowth c. 0.4 mm from the base of the column; free part 0.9–1.6 mm long, apically without auricles. *Epichilium* 3.8–5 by 2.5–5 mm; sidelobes obovate, triangular or obliquely rectangular, 1–2 by 1.4–2.2 mm, spreading or bent forwards; endlobe obovate with a broad base to spatulate, 1.4–3.1 mm long, glabrous; keels situated about on the base of the endlobe, 0.6–1.3 by 0.4–0.6 mm. *Column* about straight; stelia 0.9–1.5 mm long, tips swollen, decurved; hood not constricted, its top margin not recurved. *Pollinia* ± falcate and flattened or obovoid, the inner two narrower, c. 0.7 by 0.2–0.3 mm; stipes 0.6–0.7 mm long; viscidium 0.1–0.15 by c. 0.1 mm. *Fruit* ellipsoid to globular, to 1.5 cm long.

Distribution. ?Sikkim; Thailand; ?Laos; ?Cambodia; ?Vietnam; Malay Peninsula; Singapore, Lingga Is., Riau Is.; Sumatra, Mentawai Is., Bangka; Java; Borneo: Kalimantan, Sarawak, Brunei, Sabah (Mt Kinabalu); Philippines: Mindanao, Leyte, probably Luzon; Celebes; Moluccas: Sula Is., E. Ceram, Ternate; Lesser Sunda Islands: Flores; Palau Is.; New Guinea: Irian Jaya (Biak), Papua New Guinea; Louisiade Is.; Solomon Is.: Bougainville, Santa Isabel, Kolombangara, Guadalcanal; Australia: Cape York Peninsula southwards to Daintree River.

Ecology. Common, in primary rain forest, freshwater forest and coastal swamp forest (on *Melaleuca leucadendron* and *Pandanus* species), once on tufts of grass at the shore (Kuala Pahang), once epilithic (New Guinea); in Cape York Peninsula often on exposed sites on paperbarks (fide Dockrill, Austr. Indig. Orch. 1, 1969, 616); altitude 0–c. 1600 m. Fl. & fr. all year long.

Collector's notes. Sepals and petals greenish white to cream-coloured: sepals with a purple blotch at the tip and a more or less outstretched median purple stain, petals with purple markings varying from a longitudinal median purple stripe to only an apical purple spot. Lip cream-coloured; free part of the hypochilium purple-stained; sidelobes with a more or less clear purple centre; endlobe centrally purple with purple keels. Column purplish brown with purple stelia tipped shiny yellow. Hood and rostellum greenish white, pollinia yellow. Leaves and pseudobulbs shiny apple-green, inflorescence stalk green; peduncle scales and (floral) bracts ± transparent with a purplish median stripe, pedicels lighter green, ovaries somewhat darker.

In New Guinea besides the common form with purple markings, a lighter form with pale yellow flowers with a purplish centred lip and a green column occurs. Also entirely cream-coloured flowers occur there. Both forms occur throughout the island. From the Solomons and Cape York Peninsula only cream-coloured flowers with a white lip have been recorded.

Uses. In Malaysia the roots and leaves are boiled to make a drink against fever and headache (fide Ridley, J. Linn. Soc. Bot. 32, 1896, 384).

Vernacular names. Ruhini (Thailand); angrek darat, benang hantu, sakat bawang, sakat ubat kapalo (Malay Peninsula); pamuleh (Penang); tongkil-tongkil (Karo Batak, Sumatra), bosoer bosoer haoe, b. b. oetan, b. b. tombak (Sumatra East Coast), ki plengpeng (Sundanese); gaere (New Guinea, Musa), sakko (ibid., Amele), sandaru (ibid., Orokaiva).

Notes. 1. The shape of the lip is very variable throughout the whole area. The sidelobes vary from triangular to almost rectangular or obovate. In addition a considerable variability in size occurs and the endlobe varies in relative width and length. In some collections the sidelobes and the endlobe bear short papillae-like hairs. This variation is not linked to the pattern of geographical distribution. The plants of New Guinea, the surrounding islands and Cape York tend to branch more frequently (with inflorescences with up to 200 flowers) than plants from other parts of the area. The lip is sometimes more distinctly lobed, with \pm obovate sidelobes which are slightly bent forward, and a narrower and longer endlobe. However, intermediate forms with the 'regular', \pm triangular sidelobes and an obovate endlobe are present in the area. In addition, no correlation between the more distinctly 3-lobed lip and the white colour has been found. For these reasons we refrain from distinguishing a variety *nelsoniana*: all New Guinea and Australian collections belong in our opinion to var. *javanica*.

2. Many collectors record that this variety grows in ants' nests on tree trunks, and often have ants' passages between the pseudobulbs. Docters van Leeuwen (1929, l.c.) ascribes this to the fact that the ants eat drops of fatty oil (elaiosomes) which are located in the cells of the seed wing. The ants carry the seeds to their nest where many seeds are able to germinate. Possibly the plants profit from nutrients in the waste material in the ants' nests.

3. The type of *A. sumatrana* Schltr. was not studied; it is probably lost. This species, according to Schlechter, differs from *A. javanica* by its anther hood which is of equal size but more rounded and has a clearly crenulate margin. It should also have a simple, not bifurcate rostellum, which seems dubious as throughout the genus the rostellum is always deeply split. Schlechter's specimen was damaged, the reason he could not distinguish the shape of the lip. The description resembles closely that of *A. javanica* var. *javanica*; we tentatively consider Schlechter's species to belong to this variety.

4. The type of *A. insulari-sylvatica* Fukuyama from the Palau Islands was not studied; the species is said to have 1(–2?) leaves, a short inflorescence 15–20 cm long with 5(–20) flowers. According to the description of the flower, this taxon belongs to *A. javanica* var. *javanica*. We have seen two other collections from the same locality belonging to this variety.

5. *Acriopsis harai* Tuyama from Sikkim is said to have a more robust habit than *A. javanica*. It should also differ in the shape of the keels, having 'not a trace of apical bilobation throughout.' The photograph and the drawing of the type specimen show a flower fully resembling *A. javanica* var. *javanica*, therefore we consider the Sikkim specimen to be conspecific with this variety. This collection then would mark the most northern locality of the genus.

b. var. floribunda (Ames) Minderhoud & de Vogel, *comb. nov.* – Fig. 1 d, e.

Acriopsis javanica (non Reinw. ex Blume) Schltr., Oest. Bot. Zeitschr. 50 (1900) 287, p.p.

Acriopsis floribunda Ames, Orch. 6 (1920) 306; in Merr., Enum. Philip. 1 (1925) 398. – Type: BS 35112 (K), from Bucas Grande Island, Philippines.

Pseudobulbs: internodes 7–8. Leaves: petioles 8–15 mm long; blade 12–19 cm by 9–12 mm. Panicle 200–250-flowered, 60–115 cm long; basal scales 16–19 mm long; peduncle 37–60 cm long; rhachis 22–65 cm long; branches 1–7, to 55 cm long, sometimes with secondary branches. Floral bracts 1–1.9 mm long. Synsepalum 5.3–7.2 mm long, nerves 2, 4

or 5. *Petals* 2–2.6 mm wide. *Hypochilium*: adnate part inflated, basal outgrowth c. 1 mm from the base of the column; free part c. 0.5 mm long, apically without auricles. *Epichilium* 4.8–6.2 by 2–2.4 mm; sidelobes obovate, 0.6–0.9 by 0.7–1.2 mm, bent forwards; endlobe ligulate, 2.6–3.8 mm long, glabrous; keels situated \pm halfway the endlobe, erect, 0.6–1.2 by 0.6–0.7 mm. *Column* slightly curved; stelia 1.2–1.8 mm long, tips flattened sideways, curved towards each other; hood not constricted, its top margin not recurved. *Pollinia* \pm falcate, flattened, the inner two narrower, c. 0.8–0.9 by 0.1 mm; stipes 0.5–0.8 mm long; viscidium c. 0.1 by 0.1 mm. *Fruit* not seen.

Distribution. Philippines: BS 35112 from Bucas Grande Island; Cuming 2067 and Merrill 9769 without detailed localities.

Ecology. In dry forest on a tree trunk; altitude not known. Fl. June.

Collector's note. Flowers greenish yellow.

c. var. auriculata Minderhoud & de Vogel, *var. nov.* – Fig. 6.

Acriopsis javanica (non Reinw. ex Blume) Blume, Tab. (1825) f. 71; Schltr., Oest. Bot. Zeitschr. 50 (1900) 287, p.p.; J.J. Smith, Bot. Jahrb. 48 (1912) 103; Ames in Merr., Enum. Born. (1921) 193; J.J. Smith in Fedde, Rep. 32 (1933) 349, p.p.; Carr, Gard. Bull. Str. Settl. 8 (1935) 121, p.p. – **Type**: Haviland s.n. (K), from Kuching, Sarawak.

Synsepalum 5.1–6.3 mm longum. **Petala** 1.3–2.3 mm lata. **Hypochilii** pars adnata valde inflata medio constricta, appendiculo basali patenti vel deflexo 1.2–1.7 mm longo, pars libera apice duobus auriculis marginalibus parvulis alter alterum versum 0.2 mm longis crassisque. **Epichilium** lobis lateralibus divergentibus ca. triangularibus 1.4–1.5 mm longis, 1.3–1.4 mm latis apice rotundata. **Lobus terminalis** anguste spathulatus 2.1–3 mm longus. **Clinandrium** medio constrictum 1.2 mm longum, margine apicis leviter reflexa. **Pollinia** fere sibi constantia, viscidium magnum ovatum 0.2–0.3 mm longum, 0.15–0.2 mm latum. – **Type**: Haviland s.n. (K), Kuching, Sarawak.

Pseudobulbs: internodes 6–7. **Leaves**: petiole 8–20 mm long; blade 14–32 cm by 10–14 mm. **Panicle** 34–300-flowered, 33–97 cm long; basal scales 10–19 mm long; peduncle 35–55 cm long; rhachis 22–41 cm long; branches c. 4, to 41 cm long, often with secondary branches. **Floral bracts** 2–3 mm long. **Synsepalum** 5.1–6.3 mm long, nerves 2, 4 or 5. **Petals** 1.3–2.3 mm wide. **Hypochilium**: adnate part strongly inflated, constricted in the middle, basal outgrowth c. 1 mm from the base of the column; free part 1.2–1.7 mm long, apically with two marginal auricles c. 0.2 mm long, 0.2 mm diam. which are directed towards each other. **Epichilium** 3.6–5.3 by 3.2–3.9 mm; sidelobes spreading, \pm triangular, 1.4–1.5 by 1.3–1.4 mm, apex rounded; endlobe narrowly spathulate, 2.1–3 mm long, sometimes with hair-like papillae to c. 0.1 mm long; keels situated about on the base of the endlobe, 0.5–0.8 by 0.4–0.6 mm. **Column** about straight; stelia 1.2–1.8 mm long, tips swollen, decurved; hood constricted in the middle, margin of the apex slightly reflexed. **Pollinia** \pm falcate and flattened, of equal size; c. 0.6 by 0.2 mm; stipes 0.9–1 mm long; viscidium relatively large, ovate, 0.2–0.3 by 0.15–0.2 mm. **Fruit** 1.3–2.4 cm long.

Distribution. Burma (Tenasserim); North Vietnam; Malay Peninsula; SE. Sumatra; Java; Borneo: Sabah, Brunei, Sarawak, Kalimantan.

Ecology. Epiphytes in primary and secondary forest; altitude 0–550 m. Fl. & fr. Jan., March, April, July, Aug., Dec.

Collector's notes. Pedicel pink, ovary pale brown. Petals and sepals whitish, mostly with a longitudinal purple stripe, sometimes at the base and the tip pale orange with a white margin. Lip pale purple or whitish, mostly with a darker centre. Column pale red-brown with yellow-tipped stelia and a whitish hood. In some collections the flowers are completely white.

Vernacular name. Kambang sa-tahun (Brunei).

Note. It may be possible that *A. annamica* Finet (see under nomina dubia) from Qui-nhon, South Vietnam, corresponds with *A. javanica* var. *auriculata*. The two taxa have in common the swollen base of the hypochilium, the two callosities at the base of the sidelobes and the arched anther hood. The type specimen of *A. annamica* was not studied because it was not among the specimens received from P; it is probably lost. We refrain from using this epitheton for the variety of *A. javanica*.

6. *Acriopsis ridleyi* Hooker f. — Fig. 7; Plate 2a, b.

Acriopsis ridleyi Hooker f., Fl. Brit. India 6 (1890) 79; Ridley, J. Linn. Soc. Bot. 32 (1896) 385; Schtr., Oest. Bot. Zeitschr. 50 (1900) 249, 288; Ridley, Mat. Fl. Mal. Pen. 1 (1907) 187; Rolfe, Orch. Rev. 20 (1912) 160; Schltr., Orch. (1915) 368; Orchis 9 (1915) 94, f. 16–21; Ridley, Fl. Mal. Pen. 4 (1924) 190, f. 174; Holttum, Orch. Malaya (1953) 551. — Type: Ridley s.n. (SING), from Singapore.

Plants entirely glabrous except the lip sometimes somewhat hairy, 17–41 cm high. Main roots 1–3 mm diam., catch-roots 0.2–0.7 mm diam. Rhizome 3–5 mm diam., between the pseudobulbs with c. 3 internodes 1.5–3 mm long; scales 6–8 mm long. Pseudobulb scales 2–3, 1.6–3 cm long. *Pseudobulbs* 0.5–1 cm apart, 1.2–2.7 by 0.8–1.3 cm, with 4–7 internodes. *Leaves* 2–3 (–4) per pseudobulb; petiole 2–10 mm long; blade narrowly linear, 5–21 cm by 2–7 mm, apex obtuse to sometimes acute. *Inflorescence* simple, rarely sparsely branched, 13–46-flowered, erect, 17–37 cm long; basal scales appressed, 3–4, 6–8 mm long; peduncle 9–21 cm long, 1–1.5 mm diam., with 2 internodes; peduncle scales appressed, 2.5–6 mm long; rachis 9–16 cm long; branches if present few, to c. 13 cm long. *Floral bracts* 1.2–1.7 by 0.5–1.5 mm. *Flowers* usually in clusters of 2–3 together, 2–25 mm apart, 8–1 mm diam. Pedicel 4.2–6.4 mm long, 0.2–0.3 mm diam. *Median sepal* 4.1–6.3 by 1.8–2.3 mm; apex obtuse, nerves 3. *Synsepalum* 4–6.6 by 1.7–2.6 mm; apex obtuse; nerves 4–6. *Petals* obovate, 4–6 by 1.9–2.8 mm; apex rounded; nerves 3 or 5. *Lip* 3-lobed, panduriform. *Hypochilium*: adnate part c. 2 mm long, centrally constricted; basal outgrowth c. 0.3 mm up the column, 0.7–0.8 mm long, deflexed; free part narrowed, ± canaliculate, 0.9 by 0.3 mm. *Epichilium* slightly S-curved, 3.5–4.2 by 2.2–3 mm; sidelobes oblong, bent forwards, 1.2–1.7 by 0.8–1 mm, tips rounded, sometimes sparsely covered with very short hairs; endlobe broadly spatulate, basal part narrowed, c. 0.9 by 0.7 mm, sometimes with hairs to 0.1 mm long, apical part abruptly widening from the base, ± orbicular, 1.5–2.1 by 2.2–3 mm, slightly deflexed, convex in the centre, the edges concave, apex emarginate; keels on the base of the endlobe, erect, ± triangular, 0.9–1.2 by 0.6–0.7 mm, tips obtuse. *Column* S-curved, 2.8–3.7 mm long; stelidia 1.2–1.7 mm long, 0.2 mm diam., tips slightly swollen, decurved; hood 1.9–2.1 mm long, top margin entire, reflexed. *Stigma* elliptical in outline; rostellum beak-like, 1–1.2 mm long. Anther pear-shaped, 0.7 by 0.5 by 0.4 mm. *Pollinia* elongated, the inner two narrower, 0.7 by 0.2 mm, tips acute; stipes 0.9 mm long; viscidium c. 0.1 mm diam. Ovary 2.3–3.8 mm long. *Fruit* ellipsoid, 1.1–1.3 by 0.8–1 cm.

Distribution. Malay Peninsula; Singapore; Borneo: Sarawak, Kalimantan (Kalimantan Selatan).

Ecology. Epiphytes on trees in open scrubbery, one collection harbouring ants between the pseudobulbs; altitude 30–1500 m. Fl. April, Nov.; fr. May.

Collector's notes. Sepals and petals cream-coloured to yellowish, with a brown or purple spot near the apex (also recorded are flowers with spots all over). Lip white with a longitudinal mauve band, or entirely white with pink or magenta keels. Column green or purplish at the base with a green or white hood, sometimes at the back with small dark spots. Stelidia green with yellow tips.

Doubtful species

Acriopsis annamica Finet, Not. Syst. II, 1 (1911) 25; Const., Atl. Orch. Cult. (1913) 30, f. 34. – *Acriopsis annamensis* Guill., Fl. Gén. I-C. 6 (1933) 533; Seidenf., Contr. Rev. Orch. Fl. Camb. (1975) 5. – Type: Guibert s.n., from Qui-nhon, Vietnam (not seen).

Distribution. Vietnam.

Note. This species is said to differ from *A. javanica* by the swollen pouch-like base of the hypochilium, the triangular sidelobes with at their base two hemispherical callosities, the acute keels, the short arched anther hood and the triangular viscidium. The specimen should have small pseudobulbs and 2, rarely 3 leaves. It may be possible that this taxon corresponds with *A. javanica* var. *auriculata* (see also note 2 under that variety).

Excluded species

Acriopsis latifolia Rolfe, Kew Bull. 9 (1909) 368; Schltr., Orch. (1915) 368. – Type: Cult. Hort. Bot. Kew. s.n. (K), from the Malay Peninsula = *Thecostele ?alata* (Roxb.) Par. & Rchb. f.