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PETER C. BOYCE[1] & WONG SIN YENG[2]

Studies on *Schismatoglottideae* (*Araceae*) of Borneo XXVII – New species of *Aridarum*, and notes on the *Aridarum* Rostratum Complex

Abstract

Boyce P. C. & Wong S. Y.: Studies on *Schismatoglottideae* (*Araceae*) of Borneo XXVII – New species of *Aridarum*, and notes on the *Aridarum* Rostratum Complex. – Willdenowia 43: 91–99. June 2013. – Online ISSN 1868-6397;
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Two taxonomically novel *Aridarum* species are described from Kalimantan Barat, Indonesian Borneo: *A. hippocrepis* P. C. Boyce & S. Y. Wong and *A. uncum* P. C. Boyce & S. Y. Wong. Together with *A. rostratum* Bogner & A. Hay (also Kalimantan Barat) these form a morphologically distinct group of unistaminate *Aridarum* species, here informally dubbed the *Aridarum* Rostratum Complex, differing from those of the (also unistaminate) Burttii Complex by the inflorescence pendent on an arching to pendent wiry peduncle, by staminate flowers lacking a distally expanded connective, the presence of horseshoe-shaped interstice staminodes that expand laterally post pistillate anthesis and prior to staminate anthesis, by the spathe limb hardly opening at pistillate anthesis and deliquescing acroscopically during staminate anthesis, and by the narrowly campanuliform (not salverform) persistent lower spathe. The Rostratum Complex is further differentiated by leaf blades lacking the adaxially conspicuously raised primary lateral veins that are a characteristic of the Burttii Complex. Recognition of these two new species takes the genus *Aridarum* to 14 accepted species. An emended species description of *A. rostratum* is presented and a key to species of the Rostratum Complex is provided. All species are illustrated from living plants, and a comparative plate of the spadices of the three species assigned to the Rostratum Complex is also provided.

Additional key words: Indonesia, Kalimantan Barat, rheophytic, granite, sandstone

Introduction

In proposing the *Aridarum* Burttii Complex, Wong & al. (2012) called attention to another group of unistaminate *Aridarum* species centred on *A. rostratum* Bogner & A. Hay (Bogner & Hay 2000) and appearing to constitute yet another group morphologically distinct to the Burttii Complex. Subsequently, further plants obviously similar to, although clearly differentiated from *A. rostratum* have come to light such that we now feel justified in describing these as novelties, and proposing a further informal taxonomic group – the *Aridarum* Rostratum Complex. In addition to describing new species, we have had the opportunity also to examine several living collections of *A. rostratum* which has enabled a modified and more comprehensive species description than was previously possible from the single known preserved collection.

Results and Discussion

Aridarum hippocrepis P. C. Boyce & S. Y. Wong, **sp. nov.** Holotype: Indonesian Borneo, Kalimantan Barat, Kabupaten Sekadau, Kecamatan Nanga Taman, 4 Apr 2012, *K. Nakamoto AR-3842* (BO!; isotype: SAR!).

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Fig. 1. *Aridarum hippocrepis* – A: plant in habitat; B: inflorescence at early pistillate anthesis; C: spadix (spathe artificially removed) at onset of staminate anthesis; D: detail of fertile zones of spadix, onset of staminate anthesis; note that the interpistillar staminodes are beginning to expand laterally; E: inflorescence during staminate anthesis, with the ragged liquefying portions of the spathe limb still adhering to the lower spathe, and the laterally expanded staminodes clearly visible blocking the entrance of the persistent lower spathe; F: inflorescence post anthesis, the lower spathe artificially removed; note that the spent parts of the spadix have withered, and that the interstice staminodes are beginning to turn green. – Photographs all from *K. Nakamoto AR-3910*; A by K. Nakamoto; B–F by P. C. Boyce.

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Diagnosis — Inflorescences of *Aridarum hippocrepis* most closely resemble those of *A. rostratum* Bogner & A. Hay by the short, slender setiform thecae horns and brain-like appendix staminodes, but differ by the staminate flowers with only the margins of the connective verruculose, the centrally sulcate (not ovate and raised) strongly horseshoe-shaped connective, and by the conspicuous (not obscure) suture separating the thecae of each staminate flower. In vegetative appearance *A. hippocrepis* is distinct from *A. rostratum* by the narrowly oblong smooth leaf blades with the primary lateral venation abaxially obscure (vs leaf blades broadly elliptic with the primary veins impressed with the blade somewhat quilted). In overall appearance plants of *A. hippocrepis* resemble *A. uncum* but are differentiated by staminate flowers with verruculose margins (vs staminate flowers smooth), and by the short (c. 0.5 mm long), slender (not long (c. 1.3 mm long), stout) thecae horns.

Description — Medium-sized obligate clumping rheophytes 15–25 cm tall. *Stem* condensed, suberect, later to c. 10 cm long × c. 1.5 cm in diam. with copious strong roots. *Leaves* up to 15 together, petioles suberect with blades arching; *petiole* 5–14 cm long, laterally somewhat compressed, c. 2 mm wide × c. 3 mm high, distally weakly dorsally channelled, with the edges slightly raised and rounded, sheathing at the extreme base, medium green; *petiolar sheath* with wings extended into a narrowly triangular ligular portion 5–8 cm long, ligule persistent; *blade* softly coriaceous, elliptic, 14–16.5 cm long × 5–5.5 cm wide, base cuneate, apex acute to slightly acuminate, apiculate for c. 5 mm, adaxially semi glossy medium to dark green, slightly paler abaxially; *midrib* abaxially prominent until c. halfway along the blade, adaxially slightly sunken with the halves of the leaf blade arising at c. 10°, with 4 or 5 adaxially prominent *primary lateral* veins on each side, these diverging at c. 30°; *interprimary veins* roughly equalling the primaries in appearance; secondary venation adaxially invisible, abaxially forming a slightly darker reticulum. *Inflorescence* solitary, subtended by a 8–11 cm long, very narrowly triangular somewhat leathery cataphyll; *peduncle* very slender, arching with the inflorescence pendent, exceeding the petioles, 9–15 cm long, 2–2.3 mm in diam., terete, pale glaucous-green, inserted ventral-obliquely on the spathe; *spathe* broadly ovate, not constricted, barely opening at pistillate anthesis, 6–7 cm long, lower part narrowly campanuliform at anthesis, weakly gibbous ventrally, pale glaucous-green, ultimately persistent through fruiting, limb glistening white, apiculate for up to 7 mm, apicule distally green; limb loosening at pistillate anthesis, prior to and during staminate anthesis deliquescent and crumbling from the junction of the spathe limb and the persistent lower part, limb tearing into jagged adherent strips that eventually fall to leave a brown slimy collar of decomposing tissue that this later rots and falls to leave the narrowly campanuliform persistent lower spathe, with a scarred irregular rim. *Spadix* subcylindric 3–4 cm long × c. 6 mm in diam. (widest part); *pistillate flower zone* slender cylindric, markedly thinner than the rest of the spadix, comprising c. ¼ of the spadix, slightly obliquely inserted on peduncle, zone c. 3.5 mm in diam., ventral side 6–9 mm long, dorsal side 4–6 mm long, with an single row of c. 1.5 mm long clavate-vermiform glossy white staminodes at the base; *pistils* trapezoid-subglobose, truncate, c. 1.1 mm in diam., ivory; *stigma* sessile, slightly impressed, discoid, papillose, only slightly less wide than ovary, cream; *sterile interstice* slender cylindric, abruptly truncate with the top of the pistillate zone, c. 2 mm long, with several dense whorls of staminodes; *interstice staminodes* well-developed, clavate with a horseshoe-shaped head, with the arms of the horseshoe directed towards the base of the spadix, c. 1.5 mm wide, initially interpistillar zone equalling the staminate zone in width, later (at staminate anthesis) staminodes expanding laterally by extension of the filament until zone c. 6.5 mm wide and blocking access to the pistils; *staminate flower zone* c. ¼ of total spadix length, 7–9 mm long × c. 5.5 mm wide, cylindrical, basally merging with the interstice and apically merging with the appendix; *staminate flowers* each comprised of a single stamen, ivory, ± horseshoe-shaped in plan view, with a conspicuous deep narrow suture between the thecae, c. 1.5 × 1.5 mm, connective with the inner part slightly channelled, smooth, and the distal margins (with respect to spadix axis) verruculose; *thecae* ellipsoid, imperceptibly embedded in the ends of the 'arms' of the horseshoe-shaped connective, each c. 0.3 mm long, displaced to the proximal (with respect to the spadix axis) side of the stamen with distal-pointing horns; *thecae horns* c. 0.5 mm long, stiff, translucent except for the base, directed upwards; *appendix* 10–16 mm long, usually comprising slightly more than ½ of the entire spadix, cylindrical, obtuse; *appendix staminodes* mostly comprised of very densely-packed circular and partially coherent verruculose brain-like staminodes, lowermost staminodes closely reminiscent of staminate flowers but lacking thecae horns, terminal-most few more laxly arranged, medium yellow. *Infructescences* pendulous. *Fruiting spathe* narrowly campanuliform, c. 3 cm long × c. 1.5 cm wide, pale slightly glaucous-green with a ragged scar along the rim; persistent staminodes initially glossy white, later becoming green; *immature fruits* prismatic-globose, c. 2 mm tall and in diam.; stigmatic remains sunken; *ripe fruits and seeds* not seen. – Fig. 1.

Ecology — *Aridarum hippocrepis* grows on sandstone river boulders and waterfalls under wet lower hill forest at about 200 m above sea level.

Distribution — *Aridarum hippocrepis* is known only from the type locality.

Etymology — The species epithet is from Greek, *hippos* (a horse), and *crepis* (a shoe), thus, a horseshoe, in allu-

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sion to the shape of the staminate flowers, and interstice staminodes.

Discussion — *Aridarum hippocrepis* and *A. uncum* (see below) are very similar in appearance when not flowering, both having smooth rather broad dark green leaf blades. The limited material to hand suggests that *A. hippocrepis* never forms the stout creeping stem that appears diagnostic for *A. uncum*, but more observations are required. The only known localities of the two species are 250 km distant.

Aridarum rostratum Bogner & A. Hay in Telopea 9: 191. 2000.
Holotype: Indonesian Borneo, Kalimantan Barat, Sekadau, Bidang Menabei, 00°20'0"S, 112°26'60"E, Dec 1924, *H. Winkler 1066* (L!; isotype: HBG). Longitude and latitude estimated from Google Earth; date calculated from Cyclopaedia of Malesian Collectors (www.nationaalherbarium.nl/FMCollectors/W/WinklerHans.htm).

Description — Medium-sized obligate clumping rheophytes 20–35 cm tall. *Stem* condensed, 4–5 cm long × 0.5–0.7 cm in diam., with tough roots emerging through the leaf bases. *Leaves* 8–15 together; *petiole* 5–20 cm long × 1.2–4 mm in diam., stoutly turgid and weakly D-shaped in cross-section, scabrous, especially the ventral surface, adaxially medium green; *petiolar sheath* with the wings extended into a sublinear ligular apically rounded portion 4.5–9 cm long, ligule persistent; *blade* coriaceous, narrowly elliptic to narrowly obovate, 6–18 cm long × 2–5.5 cm wide, base cuneate, apex cuspidate and apiculate for 1–3 mm, adaxially semi glossy dark green, paler abaxially, margin occasionally slightly undulate; *midrib* abaxially prominent, adaxially ± flush with the blade; *primary lateral veins* 5–7 on each side, diverging at 35°–40°, adaxially rather impressed, giving the leaf blade a quilted appearance; *interprimary veins* alternating with primaries, pellucid and very conspicuous in fresh material, faint in dried material, running to a marginal vein; *secondary venation* abaxially and adaxially very faint; *tertiary venation* obscure. *Inflorescence* solitary; *peduncle* slender, exceeding the petioles, 15–22 cm long × 1.2–3 mm in diam. *Spathe* 6–8 cm long, more than twice the length of the spadix, broadly lanceolate, the upper part extended into a long straight beak c. 0.9 cm long, barely opening at pistillate anthesis, lower persistent part of spathe dark, the remainder glistening white, limb caducous by deliquescence at the junction with the persistent lower part at staminate anthesis, falling in ragged, adhering strips. *Spadi*x subcylindric, 2.5–3.9 cm long; *pistillate flower zone* slender slightly obconic, markedly thinner than the rest of the spadix, comprising c. ⅓ of the spadix, 8–11.5 mm long × 3.5–4 mm in diam., adnate to the spathe in the lower ⅓–½; with an incomplete row of clavate-cylindrical yellow-tipped staminodes at the base; *pistils* crowded, subglobose, c. 1 mm in diam.; *stigma* sessile, discoid, contiguous with neighbouring stigmas, drying dark brown, rather coarsely papillate; *sterile interstice* slightly obconic, 2–3 mm long × distally 5–6 mm in diam., with 2–4 irregular whorls of staminodes from c. 0.5 mm (basal ones) to 0.9 mm in diam. (distal ones), these triangular-cordate from above, aligned with the points facing the spadix apex, truncate, verruculose on the surface; *staminate flower zone* c. ⅓ of entire spadix length, 7–11 mm long × 5–7 mm in diam., creamy yellow; *staminate flowers* large, spirally arranged, truncate, circular-rhomboid from above, apically verruculose, 1.2–1.4 mm in diam.; *thecae* together on the proximal (with respect to the spadix axis) side of the anther, with conspicuous 0.8–1.2 mm long upturned horns each ending in a very narrow pore; *appendix* 10–14 mm long × 5–6 mm in diam., slightly tapering, obtuse; *appendix staminodes* resembling stamens without thecae. *Infructescences* pendulous. *Fruiting spathe* campanuliform, c. 2.5 cm long × c. 1.5 cm wide, dark green with a scar along the rim; persistent staminodes initially glossy white, later becoming green; *immature fruits* prismatic-globose, c. 1.7 mm tall and in diam.; stigmatic remains sunken; *ripe fruits and seeds* not seen. – Fig. 2.

Ecology — Rheophytic on sandstone waterfalls, and along rocky river banks in perhumid hill or upper hill forest; 250–700 m above sea level.

Distribution — Restricted to the southern parts of Melawi and Sanggau on the central northern lower flanks of the Schwaner mountains.

Etymology — From Latin, *rostratus* (masc.) meaning beaked, curved, hooked, with a crooked point, and referring to the elongated tip to the spathe.

Additional specimens seen — Indonesian Borneo: Kalimantan Barat: Kabupaten Melawi, Kecamatan Nangga Pinoh, 33 km south of Nanga Pinoh or 11 km before Kotabaru junction of logging road leading to Kalimantan Tengah border, *K. Nakamoto AR-3532* (BO!, SAR!); Kabupaten Melawi, Kecamatan Nangga Pinoh, Jalan 28, 8 km east of Kampong Nyangai, Landau Garong, 25 km along logging road south of Nangga Pinoh, Ulu Sungai Reret at Kuala Sentulang, 00°34'31.9"S, 111°56'30.8"E, *K. Nakamoto AR-3533* (BO!, SAR!); Kabupaten Melawi, Kecamatan Nangga Pinoh, Desa Sanggau Mandri (km 50 from Nanga Pinoh), 7 km south, waterfall on right hand side, 00°44'15.4"S, 111°46'09.4"E, *K. Nakamoto AR-3538* (BO!; SAR!).

Discussion — Hay & Bogner (2000), describing from the single herbarium specimen available to them, reported the petioles of *Aridarum rostratum* to be canaliculate. All living material we have seen has the petiole D-shaped

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Fig. 2. *Aridarum rostratum* – A–C: plants in habitat; note the pendent inflorescences visible (B, centre and mid right); D: inflorescence at early pistillate anthesis; E & F: inflorescence at staminate anthesis; note that with the majority of the spathe limb is already shed; G: spadix (spathe artificially removed) at onset of staminate anthesis; H: detail of spadix fertile zones at onset of staminate anthesis; note that the interpistillar staminodes are beginning to expand laterally. – Photograph A from *K. Nakamoto AR-3538*; B–H from *K. Nakamoto AR-3532*; A–F by K. Nakamoto; G and H by P. C. Boyce.

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in cross-section, and stoutly turgid; channelling observed in herbarium material is an artefact of drying.

Aridarum uncum P. C. Boyce & S. Y. Wong, **sp. nov.**
Holotype: Indonesian Borneo, Kalimantan Barat, Kabupaten Kapuas Hulu, Kecamatan Putussibau, Gunung Sepangin, 31 km south of Putussibau, Gua Maria Lourdes Burongkong, 00°34'01.39"N, 112°55'38.98"E, 10 Apr 2012, *K. Nakamoto AR-3901* (BO!; isotype: SAR!).

Diagnosis — *Aridarum uncum* is distinguished from all other species in the Rostratum Complex by the smooth staminate flowers, and long (c. 1.3 mm), stout thecae horns. When not in flower plants of *A. uncum* are reminiscent of those of *A. hippocrepis*, although the stout creeping stem seems diagnostic for *A. uncum*.

Description — Medium-sized obligate clumping to stoutly-creeping rheophytes 20–25 cm tall. *Stem* condensed, suberect, later to c. 35 cm long × c. 2.5 cm in diam. with copious strong roots and conspicuous triangular buds with an associated petiole scar. *Leaves* up to 6 together, petioles suberect with blades arching; *petiole* 6–8 cm long × c. 3 mm in diam., terete and distally weakly dorsally channelled, sheathing at the extreme base, medium green; *petiolar sheath* with wings extended into a narrowly triangular ligular portion 5–8 cm long, ligule persistent, eventually shed to leave incurved, folded margins of the sheath; *blade* softly coriaceous, elliptic to oblanceolate, 14–20 cm long × 7–9 cm wide, base cuneate or slightly decurrent, apex acuminate, apiculate for c. 3 mm, adaxially semi glossy dark green, slightly paler abaxially; *midrib* abaxially prominent until c. half way along the blade, adaxially slightly raised for the first third of the blade, thereafter sunken; *primary lateral veins* c. 6 on each side, barely discernible, diverging at c. 30°; *interprimary veins* slightly weaker than the primaries; *secondary venation* adaxially invisible, abaxially forming a slightly darker reticulum. *Inflorescence* solitary, subtended by a 9–13 cm long, very narrowly triangular somewhat leathery two-keeled cataphyll; *peduncle* very slender, arching with the inflorescence pendent, exceeding the petioles, 9–11 cm long × 2–2.3 mm in diam., terete, medium green; *spathe* broadly lanceolate, not constricted, 6–11 cm long, lower part narrowly campanuliform at anthesis, pale green, ultimately persistent through fruiting, limb glistening white, apiculate for up to 13 mm, apicule green; limb loosening at pistillate anthesis but hardly opening, prior to and during staminate anthesis deliquescent and crumbling from the junction of the spathe limb and the persistent lower part, limb tearing into jagged adherent strips that eventually fall to leave a brown slimy collar of decomposing tissue that this later rots and falls to leave the narrowly campanuliform persistent lower spathe, with a scarred irregular rim. *Spadix* subcylindric 3–6 cm long × 6–7 mm in diam. (widest part); *pistillate flower zone* slender cylindric. markedly thinner than the rest of the spadix, comprising c. ¼ of the spadix, obliquely inserted on peduncle, zone c. 3.5 mm in diam., ventral side 8–12 mm long, dorsal side 4–9 mm long, with an a few c. 1.5 mm long clavate-vermiform glossy white, yellow-tipped staminodes at the base; *pistils* compressed-globose, c. 1 mm in diam., pale green; *stigma* sessile, slightly impressed, discoid, papillose, slightly less wide than ovary, greyish; *sterile interstice* slender cylindric, abruptly truncate with the top of the pistillate zone, c. 3.5 mm long, with 3 or 4 dense whorls of staminodes; *interstice staminodes* well-developed, clavate with a cordate-triangular to horseshoe-shaped head, with the arms of the horseshoe directed towards the base of the spadix, c. 2.5 mm wide, initially equalling the staminate zone in width, later (at staminate anthesis) staminodes expanding laterally by extension of the filament until zone 5–7 mm wide; *staminate flower zone* c. ½ of total spadix length, 8–17 mm long × 4.5–6 mm wide, cylindrical, basally merging with the interstice and apically merging with the appendix; *staminate flowers* each comprised of a single stamen, ivory, ± horseshoe-shaped in plan view, c. 1.5 × 1.5 mm, connective smooth, shiny; *thecae* ellipsoid, imperceptibly embedded in the ends of the 'arms' of the horseshoe-shaped connective, each c. 0.4 mm long, displaced to the proximal (with respect to the spadix axis) side of the stamen with distal-pointing horns; *thecae horns* c. 1.3 mm long, stiff, white, directed upwards during pistillate anthesis, reflexing to point outwards or somewhat downwards at staminate anthesis, and then producing a droplet from the tip; *appendix* 10–13 mm long, usually comprising slightly more than ⅓ of the entire spadix, conic-cylindrical, obtuse; *appendix staminodes* mostly comprised of densely-packed free or partially coherent papillate-tipped cylindrical staminodes, lowermost staminodes closely reminiscent of staminate flowers but lacking thecae horns, terminal-most few more laxly arranged, ivory. *Infructescences* pendulous. *Fruiting spathe* narrowly campanuliform, c. 1.5 cm long × c. 1 cm wide, pale green with a scar along the rim; persistent staminodes initially white, later becoming green; *fruits and seeds* not seen. – Fig. 3.

Ecology — Granite waterfalls and rocky riversides under wet hill forest; c. 490 m above sea level.

Distribution — *Aridarum uncum* is known only from the type locality.

Etymology — Latin *uncus* (masc.), to describe hooked, bent in, crooked, curved, etc. Used here in reference to the thecae horns.

Discussion — The long, stout thecae horns are diagnostic. Observations show that at pistillate anthesis the thecae horns are held almost flat against the spadix, and directed towards the tip of the spadix. At staminate an-

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Fig. 3. *Aridarum uncum* – A: cultivated plant with inflorescence at staminate anthesis; note the pendent inflorescence, and the disintegrating spathe limb; B & C: inflorescence at staminate anthesis; D: spadix (spathe artificially removed) at end of pistillate anthesis; note that the interpistillar staminodes have yet to expand, and that the thecae horns are directed upwards; E: detail of appendix, staminate zone, and interstice staminodes; F: inflorescence at late staminate anthesis, with the lower spathe artificially removed; note the deliquescing remnants of the spathe limb, that the thecae horns have reflexed, many with a droplet at the tip, and that the interstice staminodes have expanded laterally. – Photographs from *K. Nakamoto AR-3901*, A–F by P. C. Boyce.

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Fig. 4. Fresh and alcohol-preserved spadices (spathe artificially removed) of the *Aridarum* Rostratum Complex – A & B: *A. hippocrepis* from *K. Nakamoto AR-3842*; C & D: *A. rostratum;* C from *K. Nakamoto AR-3538*; D from *K. Nakamoto AR-3533*; E & F: *A. uncum* from *K. Nakamoto AR-3901*. – Photographs by P. C. Boyce.

thesis the horns rise and finish almost perpendicular to the spadix axis.

Key to *Aridarum*

1. Staminate flowers comprised of one stamen; thecae on the proximal side of the flower (with respect to spadix axis) . . . . . *Aridarum* Burttii Complex and *Aridarum* Rostratum Complex: 2
– Staminate flowers comprised of two stamens; thecae on the ends, or on the inner face of each anther of the stamen pair . . . . . Remainder of genus (see Wong & al. 2012)
2. Inflorescences on a pendent peduncle; staminate flowers with connective not expanded, horseshoe-shaped; staminodes of interstice horseshoe-shaped, expanding laterally post pistillate anthesis; lower, persistent part of spathe narrowly tubular with a flaring rim; leaf blades with primary lateral veins not conspicuously raised . . . . . *Aridarum* Rostratum Complex: 3
– Inflorescences on an erect peduncle; connective expanded on the distal side (with respect to the spadix axis) into a rim; staminodes of interstice (if present) never horseshoe-shaped and never expanding ; lower, persistent part of spathe salverform; leaf blades with the primary lateral veins conspicuously raised adaxially . . . . . *Aridarum* Burttii complex (see Wong & al. 2012)
3. Leaf blades quilted, abaxially with conspicuous pellucid interprimary veins; primary lateral veins impressed adaxially; petioles scabrous; ligular portion of petiolar sheath not persistent; staminate flowers completely verruculose . . . . . ***A. rostratum***
– Leaf blades smooth, abaxially without pellucid interprimary veins; primary lateral veins barely visible; petioles smooth; ligular portion of petiolar sheath persistent; staminate flowers glabrous or connective with a verruculose margin 4
4. Staminate flowers with connective margin verruculose; thecae horns very slender, c. 0.5 mm long . . . . . ***A. hippocrepis***
– Staminate flowers glabrous; thecae horns stout, c. 1.3 mm long . . . . . ***A. uncum***

***Aridarum* Rostratum Complex**

The *Aridarum* Rostratum Complex is defined by the pendent inflorescence on an arching to pendent wiry peduncle, by staminate flowers lacking a distally expanded connective, by the presence of horseshoe-shaped inter-

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stice staminodes expanding laterally post pistillate anthesis and prior to staminate anthesis, by the spathe limb hardly opening at pistillate anthesis, and deliquescing acroscopically during staminate anthesis, and by the narrowly campanuliform (not salverform) persistent lower spathe. The Rostratum Complex is further differentiated from the Burttii Complex by leaf blades lacking the adaxially conspicuously raised primary lateral veins.

Pollination and dispersal mechanics

Pollination and dispersal mechanisms of species of the Rostratum Complex have not been observed. In the three described species the spathe barely opens at pistillate anthesis, although there is moderate odour production – a small reminiscent of very overripe fruit/butyric acid – at pistillate and to a much less degree at staminate anthesis. In cultivation no insects have been observed visiting the inflorescences of any of the species, although multiple plants each of several other *Aridarum* species (from different informal groups) flowering contemporaneously in the nursery attract a variety of insects (*Coleoptera*: *Nitidulidae*, *Chrysomelidae*, *Staphylinidae* and *Diptera*: *Colocasiomyia*), yet fruit set is very rare. This leads us to speculate that most *Aridarum* species are pollinator specific.

In all Rostratum Complex species the developing (and presumably also mature, although not observed) infructescences are pendent on slender peduncles, and with the interstice staminodes blocking the entrance to the persistent lower spathe. It seems probable that, as in the case with *Bucephalandra* Schott, enlargement of the developing fruits eventually forces these presumably protective staminodes to be shed. Unlike *Bucephalandra*, which has splash-cup dispersal, it seems to us improbable that infructescences of species of the Rostratum Complex function as splash-cups. As with *Ooia* S. Y. Wong & P. C. Boyce (Wong & al. 2010) it is possible that water turbulence plays a role in fruit/seed dispersal.

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