

A REVIEW OF *AIDIA* s.l. (RUBIACEAE) IN SOUTHEAST ASIA AND MALESIA

C.E. RIDSDALE¹

Rijksherbarium / Hortus Botanicus, P.O. Box 9514, 2300 RA Leiden, The Netherlands

SUMMARY

The present paper reviews the genus *Aidia* s.l. (including *Anomanthodia* and *Gynopachis*) in Southeast Asia and Malesia.

Relationships to *Pelagodendron* are discussed. The taxonomic variation of characters within the genus is reviewed.

In this review 16 new species and 2 new varieties are described, and 14 new species combinations are made in *Aidia*. *Aidiopsis orophila* and *Fagerlindia canthoides* are new combinations in the respective genera. A complete index of names is given.

INTRODUCTION

There are several papers on the taxonomy of the group by Tirvengadum & Sastre (1986) and Wong (1984), the latter accepting a broad concept of the genus *Aidia* including the lianes sometimes placed in *Anomanthodia* and *Gynopachis*. Tirvengadum & Sastre (1986) restricted *Aidia* to the tree species. Later a closely related genus *Pelagodendron* (Tirvengadum, 1991) was reviewed. Tirvengadum considered the two liane genera as distinct, indicating that the flowers of these two genera are polygamo-dioecious, and considered the transversely multilocellate anthers of *Anomanthodia* to be present in functionally male flowers. However, I am not convinced that this has been demonstrated. Many collections exist with the upper inflorescences with flowers bearing transversely multilocellate anthers and lower inflorescences bearing fruit. I have not been able to demonstrate the presence of functionally male flowers, nor have I observed non transversely multilocellate anthers in the species which are represented by numerous collections. It can be questioned if this striking character of transversely multilocellate anthers is a character which can be used at generic level.

Hallé (1970) recorded this character for *Sherbournia batesii*, *Tricalysia anomala* and two species of *Dictyandra*. Robbrecht (1981) recorded it for the two species of *Calycosiphonia*. Robbrecht & Puff (1986) noted this character for some species of *Pavetta*, e.g. *P. urophylla*. In the present work it has been observed in *Aidia borneensis*. Kirkbride (1985) reported a different type of multilocellate anthers for the Neotropical genus *Kerianthera* and seven species of *Isertia*. It would appear that the multilocellate anther is a character which occasionally occurs in some species in a genus.

1) B.A. Krukoff Botanist of Malesian Botany, Rijksherbarium / Hortus Botanicus, Leiden.

Gynopachis, the remaining liane genus, is highly heterogeneous, basically being a depository for material not placed in *Anomanthodia*. Tirvengadum & Sastre (1986) place the enumerated species into three informal groups, group II corresponding to section *Xylanthorandia* of the present work. *Gynopachis impressinervis* (King & Gamble) Tirveng. has strikingly different anthers and style (see Wong, 1984: fig. 1 E, F, as 'A. *binata*'), which closely resemble some eastern Malesian tree taxa, e.g. *Anomanthodia waugia*, *A. brispensis*, and *Gynopachis zippeliana* Scheff. The variation in the form of the style is clearly related to strategy of pollen presentation, the anthers depositing the pollen on grooves of the outer surface of the style which then elongates for pollen presentation, the stigmatic surface becoming receptive for pollination at a later stage (see also Robbrecht & Puff, 1986). This accounts for the character used by Tirvengadum & Sastre (1968), stigmatic lobes divergent versus adherent. Clearly the stigmatic surface has to be exposed for cross pollination but the phasing of this seems to vary with different taxa. Within *Anomanthodia auriculata* and *A. dilleniacea* the stigmatic lobes are divergent to reflexed in all open flowers; however, in the remaining three species this has not been observed on the material available, the lobes being coherent or slightly separating at the apex. Similarly the species described here as *Aidia heterophylla* clearly has a long linear style which later becomes clearly bifid whilst this has not been observed in the closely related taxa *Gynopachis tomentosa* Blume and *G. pulcherrima* (Merr.) Tirveng. Unfortunately no field observations are available. Further studies on pollen presentation strategies are needed.

In my opinion the generic boundaries between the liane taxa are not as clear cut as inferred by Tirvengadum & Sastre (1986)

Within the lianes the group of species related to '*Randia beccariana*' seems to be most distinct, apparently having non reflexed corolla lobes. These are placed in section *Xylanthorandia* Baill., in the present work, and in group II of *Gynopachis* by Tirvengadum & Sastre (1986). Further material is required of these species, particularly to be able to relate flowering and fruiting collections.

The liane group are immediately distinguishable from the tree species (*Aidia* s.s. Tirveng.) by the growth form. The lianes have the inflorescence emerging from a leafless node, separated from the leaf bearing node by a short internode. The trees have the inflorescence which is apparently 'leaf opposed'. This is generally interpreted as taxa having a terminal inflorescence with the lateral branch taking over the growth of the axis and pushing the inflorescence to one side (see Robbrecht & Puff, 1986; Tirvengadum & Sastre, 1979, 1986 for an interpretation of the branching systems). Reduction of one leaf to a bract-like structure, or complete suppression of the leaf is the common situation. 'Pseudo-axillary' inflorescences situated at a node with normal leaves occur in some species, viz. *Aidia brispensis* and *A. waugia*, and the two New Caledonian taxa placed by Tirvengadum in *Pelagodendron*. However, even here some caution should be observed in morphological interpretation. Few serial collections are available; for the lianes there are about ten collections which include the part of the shoot bearing the adventitious roots, and half that number which include

the orthotropic growing tip. The majority of observations on the liane species and almost all observations on the tree species are based on lateral flowering shoots as represented in the herbarium collections.

The Fijian genus *Pelagodendron* has been treated in Flora Vitiensis Nova. A.C. Smith & S.P. Darwin (1988) note "Pelagodendron seems most closely related to *Aidia* Lour. The closed calyx, well described by Seemann, is striking and provides a major reason for retaining *Pelagodendron* as a very distinct genus."

This character of a closed calyx which ruptures irregularly by the expanding corolla, is quite rare in the Rubiaceae, being recorded for the African genera *Sericanthe* and *Phellocalyx*. It is one of the characters used by Tirvengadum & Sastre (1986) to define the South Indian genus *Pseudaidia*.

Tirvengadum (1991) added two further species to *Pelagodendron*. I have only been able to examine limited materials of the New Caledonian species and more extensive material of the New Guinea species also attributed to *Pelagodendron*. These indeed have a short, clavate, apparently bilobed stigma and ellipsoidal anthers but lack the closed calyx. The flower structure is remarkably similar to some African species accepted in the genus concept of *Aidia*, particularly *A. micrantha*. Also the flowers are very similar to the group of liane species from New Guinea.

If one expands the concepts of *Pelagodendron* to include taxa with non rupturing calyces then it is illogical to recognise *Pseudaidia*. The logical consequence would then be to reduce *Pelagodendron* to the synonymy of *Aidia*. I have once again restricted the genus *Pelagodendron* to *P. vitiense*, and consider that the New Caledonian species and two species from New Guinea can be accommodated in *Aidia* sect. *Randiella*.

Tirvengadum & Sastre (1986) present a concept of the species in the three genera, *Aidia*, *Anomanthodia* and *Gynopachis*. In each genus a list of species is presented, mostly without descriptions, which makes it difficult to have a concept of the species they recognise. Particularly, not all names are treated in the synonymy. They unfortunately do not include the liane species of New Guinea, except *Gynopachis zippelliana*, in the lists.

In my opinion the attempt to recognise *Aidia* as a genus restricted to tree species is premature. *Pelagodendron* and *Pseudaidia* are separated from *Aidia* s.l. mainly by the character of the splitting calyx, and some other characters which, in my opinion, are questionable at generic level. These two genera are nominally recognised in the present study. Further studies are required on flower biology, pollination strategy and on the value of seed coat testa of the different taxa and they may help to clarify the generic limits of the different groups in the future. Such studies are out of the scope of the present taxonomic study.

The present work originally began as a study of the Malesian species of *Aidia* s.l. Later the work was extended to cover the species from Southeast Asia, particularly in

respect of the old '*A. cochinchinensis* agg.'. I have not attempted to examine extensive materials of extra-Malesian species, but found a bewildering array of identifications. It is apparent that Wong (1984) and Tirvengadum & Sastre (1986) only cite a proportion of available collections. Collections are cited in a highly condensed manner, those previously cited are not included.

It is logical that the Asian and Malesian species belonging to '*Randia*' be redefined. At present many smaller genera have been recognised based on 'core species'; unfortunately many other species described under '*Randia*' still have to be placed into this framework. This is not an easy task as one is left with odd taxa with deviating characters. Continually splitting off these satellite groups as small genera, in my opinion, is no answer to the problem. In the present study little is to be gained by splitting off the lianes into one or several satellite genera. There are few characters available which would seem to have value at the generic level. In my opinion *Aidia* s.l. is a recognisable genus which can be divided into several sections. As can be seen in the key several taxa belonging to other genera appear to be closely related. *Fagerlindia canthioides* and *Oxyceros rugulosa* need to be reexamined at a future date, particularly in respect of their relationship to other Southeast Asian taxa of the *Benkara* / *Oxyceros* / *Fagerlindia* complex, which currently is poorly defined.

I have followed the practical solution chosen by Wong of not recognising the lianes *Anomanthodia* and *Gynopachis* at generic level.

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KEY TO THE SPECIES OF *AIDIA* AND OF SOME RELATED GENERA

- 1a. Inflorescence appearing leaf opposed, or pseudo-terminal 2
 b. Inflorescence from a leafless node, separated from the leaf-bearing node by a short internode. Lianes or hemi-epiphytes 27
- 2a. Hemi-epiphytic lianes, or climbers; anthers included or exserted 3
 b. Trees or shrubs; anthers exserted 5
- 3a. Anthers included; stigma conspicuously bilobed, lobes reflexed
 *Excl. 2. Aidiopsis orophila* (Miq.) Ridsdale
 b. Anthers exserted; stigma clavate to fusiform 4
- 4a. Calyx somewhat enclosing the corolla bud, usually splitting irregularly along one side. India, Western Ghats *Pseudaidia speciosa* (Bedd.) Tirveng.
 b. Calyx not enclosing corolla, not splitting. Sri Lanka
 *Excl. 3. Oxyceros rugulosa* (Thwaites) Tirveng.
- 5a. Calyx connate enclosing the corolla bud, irregularly rupturing by the expansion of the corolla. Fiji *Pelagodendron vitiense* Seem.
 b. Calyx not enclosing the corolla bud, not splitting, undulate or toothed 6
- 6a. Inflorescence reduced to a short fascicle, hardly branched 7
 b. Inflorescence well developed, conspicuously branched 13
- 7a. Leaves puberulous below. Corolla lobes lanceolate; stigma linear. China
 8. *Aidia yunnanensis*
 b. Leaves glabrous below 8
- 8a. Pedicels of fruits short, up to 3 mm. China 9
 b. Pedicels of fruits over 5 mm. Continental Asia, or Solomon Islands, New Caledonia 10
- 9a. Leaves narrowly elliptic to lanceolate, at least 5 × as long as broad, 8–20 by 1–3 cm. Flowers unknown 7. *Aidia salicifolia*
 b. Leaves elliptic, less than 5 × as long as broad, 7–14 by 1.5–6 cm
 8. *Aidia yunnanensis*
- 10a. Hypanthium puberulous 11
 b. Hypanthium glabrous 12
- 11a. Corolla tube 6–9 mm long. China, Hong Kong, Taiwan, Ryukyu Archipelago
 *Excl. 1. Fagerlindia canthioides* Tirveng. ex Ridsdale
 b. Corolla tube less than 5 mm. New Caledonia 17. *Aidia vieillardii*
- 12a. Calyx and hypanthium 4–5 mm long. New Caledonia
 18. *Aidia congestum*
 b. Calyx and hypanthium 2–2.5 mm long. Solomon Islands
 19. *Aidia brispensis*
- 13a. Corolla lobes ovate; anthers ovate to ellipsoidal, stigma club-shaped. New Guinea 20. *Aidia waugia*
 b. Corolla lobes lanceolate; anthers linear, stigma linear 14
- 14a. Flowers 4-merous 15
 b. Flowers 5-merous 16

- 15a. Calyx lobes triangular, distinctly mucronate. Leaf apex acute. Thailand, Vietnam, China, Taiwan, Japan **5. Aidia henryi**
 b. Calyx lobes undulate to shallowly triangular. Leaf apex usually long acuminate to caudate. China, Thailand **6. Aidia merrillii**
- 16a. Inflorescence cincinnoid, flowers on ultimate branches basically one at each inflorescence node; axis with numerous bracts 17
 b. Inflorescence basically a dichasial cyme, flowers on ultimate branches basically two at each inflorescence node; bracts widely spaced at each divarication .. 20
- 17a. Anthers transversely multilocellate. Inflorescence axis thin, russet pubescent. Borneo **9. Aidia borneensis**
 b. Anthers not transversely locellate 18
- 18a. Corolla lobes over 8–10 mm long; inflorescence axis thick, densely pallidly pubescent. India **10. Aidia pseudospicata**
 b. Corolla lobes (4–)5–7 mm long; inflorescence axis slender, glabrous or with slight russet pubescence 19
- 19a. Stipules short, cupular to strap-shaped, mucronate from the keel. Sri Lanka ..
 **14. Aidia gardneri**
 b. Stipules triangular. Hainan, Malay Peninsula, Sumatra, Java, Christmas Is., Lesser Sunda Islands, Celebes, Philippines, New Guinea, Solomon Islands, Australia **11. Aidia racemosa**
- 20a. Flowers subsessile. India, Thailand, Indochina **2. Aidia chantonea**
 b. Flowers pedicellate 21
- 21a. Filaments hairy. Vietnam, Hainan **1. Aidia cochinchinensis**
 b. Filaments glabrous 22
- 22a. Stipules and lower surface of the leaves, at least the midrib, sparsely to densely hairy. N Vietnam, S China, Hong Kong **4. Aidia pycnantha**
 b. Stipules and leaves glabrous 23
- 23a. Pedicels densely finely pubescent 24
 b. Pedicels glabrous 25
- 24a. Corolla lobes outside with a line of fine hairs, conspicuous in buds. India, Andaman Islands, Burma, Thailand, Malay Peninsula, Sumatra, Borneo
 **12. Aidia densiflora**
 b. Corolla lobes outside densely tomentose. Burma, Thailand, Malay Peninsula **13. Aidia parvifolia**
- 25a. Calyx lobes narrowly triangular to subulate. Corolla lobes 3–4 mm broad. Vietnam **3. Aidia oxyodonta**
 b. Calyx lobes shortly triangular to denticulate, not subulate. Corolla lobes 2–3 mm broad 26
- 26a. Inflorescence many-flowered; corolla tube 3–6 mm, lobes 9–12 mm long. Fruits 4–8 mm diam. Pacific **15. Aidia graefiei**
 b. Inflorescence few-flowered; corolla tube 1.5–2 mm, lobes 5–6 mm long. Fruit 10–15 mm diam. Australia, Queensland **16. Aidia sp.**

27a. Inflorescence reduced to a fascicle, sometimes on old wood behind leaves	28
b. Inflorescence well developed and clearly branched	38
28a. Flowers small, corolla tube up to 4.5 mm, lobes reflexed	29
b. Flowers large, corolla tube 4.5 mm or more, lobes apparently erect, or reflexed.	
Sumatra, Borneo	34
29a. Anther ovoid, less than 1.5 mm long	30
b. Anthers linear	32
30a. Distribution Malay Peninsula, Borneo	31
b. Distribution Moluccas, New Guinea, Solomon Islands	40
31a. Corolla lobes outside more or less glabrous. Malay Peninsular, Borneo	
.....	36. <i>Aidia impressinervis</i>
b. Corolla lobes outside tomentose. Borneo	37. <i>Aidia halleri</i>
32a. Petals 3–4 mm broad. Borneo	44. <i>Aidia paiei</i>
b. Petals 1–2 mm broad	33
33a. Anthers transversely locellate	50
b. Anthers not transversely locellate	35. <i>Aidia acuminata</i>
34a. Corolla tube over 15 mm long	27. <i>Aidia longiflora</i>
b. Corolla tube less than 15 mm long	35
35a. Petals acute to acuminate	36
b. Petals obtuse	37
36a. Corolla lobes c. 8 mm long, reflexed at maturity	44. <i>Aidia paiei</i>
b. Corolla lobes 12–13 mm long, apparently erect at maturity	28. <i>Aidia acutipetala</i>
37a. Corolla tube infundibular, 5–10 mm long, the lobes 12–18 by 7–8 mm, c. 2 × length of the tube	25. <i>Aidia beccariana</i>
b. Corolla tube infundibular, c. 10 mm long, broadening at top, lobes 8–10 by 2–4 mm, approx. equal to the length of the corolla tube	26. <i>Aidia jambosoides</i>
38a. Leaves small, 4–5 by 2–3 cm. Borneo	46. <i>Aidia endertii</i>
b. Leaves larger	39
39a. Anthers ovoid to ellipsoid. Moluccas, New Guinea, Solomon Islands	40
b. Anthers linear. Malesia except New Guinea & Solomon Islands	43
40a. Leaves somewhat bullate	21. <i>Aidia glabra</i>
b. Leaves not bullate	41
41a. Corolla lobes outside finely pubescent	22. <i>Aidia polystachya</i>
b. Corolla lobes outside glabrous	42
42a. Corolla tube outside with russet hairs in upper 1/3. Solomon Islands	
.....	23. <i>Aidia solomonensis</i>
b. Corolla tube outside glabrous. New Guinea	24. <i>Aidia zippeliana</i>
43a. Corolla lobes outside tomentose, pubescent, or hairy	44
b. Corolla lobes outside glabrous	47
44a. Corolla lobes short, up to 5 mm. Sumatra, Borneo	45
b. Corolla lobes over 5 mm long, usually 15–18 mm long. Java, Lesser Sunda Islands, Celebes, Moluccas, Philippines	46

- 45a. Leaves large, 28–35 by 10–12 cm. Borneo (Kalimantan) 43. *Aidia magnifolia*

 b. Leaves smaller, 12–18(–22) by (4–)5–8(–11) cm. Sumatra; Borneo (Sarawak, Brunei, Kalimantan), typically kerangas & peat swamp forest 31. *Aidia dilleniacea*

- 46a. Corolla tube inside more or less glabrous. Java, Lesser Sunda Islands, Celebes 38. *Aidia tomentosa*

 b. Corolla tube inside densely hairy, particularly in the throat. Philippines 41. *Aidia pulcherrima*

- 47a. Corolla lobes (as far as known) over 10 mm long. Celebes, Moluccas 48
 b. Corolla lobes less than 10 mm. Malay Peninsula, Sumatra, Borneo, Philippines 50
- 48a. Inflorescence densely bracteate, mature flowers unknown. Celebes 39. *Aidia bracteata*

 b. Inflorescences not densely bracteate. Fruits where known 8–15 mm diam. 49
- 49a. Corolla tube 2–4 mm long, inside glabrous. Moluccas 42. *Aidia moluccana*

 b. Corolla tube c. 7 mm, inside densely hairy in the throat. Celebes 40. *Aidia heterophylla*

- 50a. Anthers transversely multilocellate 51
 b. Anthers not transversely multilocellate 57
- 51a. Flowers 6–9- merous 52
 b. Flowers 5-merous 54
- 52a. Calyx tubular, 2–4.5 mm long. Stigma clavate, grooved or notched at the apex. Borneo 33. *Aidia lancifolia*
 b. Calyx short, up to 2 mm, cupular. Stigma bilobed 53
- 53a. Leaf base (sub)auriculate. Stigma clearly bilobed. Malay Peninsula, Sumatra, Borneo, Philippines 29. *Aidia auriculata*
 b. Leaf base not auriculate 54
- 54a. Stigma bilobed. Leaves large 12–25 by 5–10 cm 55
 b. Stigma linear-clavate, Leaves generally smaller 56
- 55a. Borneo, Philippines (Mindanao) 34. *Aidia foveata*
 b. Sumatra 29b. *Aidia auriculata* var. *indigiriensis*
- 56a. Corolla tube short, 2 mm long. Inflorescence usually well branched. Sumatra, Java, Borneo (rare) 30. *Aidia corymbosa*
 b. Corolla tube c. 4 mm. Inflorescence compact with numerous closely adpressed bracts. Philippines 32. *Aidia bakeri*
- 57a. Corolla lobes 2.5–3 mm broad. Inflorescence axis short, branches compacted. Stigma clavate 2–3 mm long 44. *Aidia paiei*
 b. Corolla lobes narrow, 1–2 mm broad. Inflorescence axis long, conspicuously branched. Stigma linear-clavate, 4 mm long 45. *Aidia kinabaluensis*

AIDIA

Aidia Lour., Fl. Cochinchin. (1790) 143; Tirveng. & Sastre, Bull. Mus. Natl. Hist. Nat., B, Adansonia, 4e sér., 8 (1986) 260; see there for full synonymy. — Type species: *Aidia cochinchinensis* Lour.

Section Aidia

Aidia subg. *Lankaidia* Tirveng., Nordic J. Bot. 3 (1983) 455. — Type species: *Aidia gardneri* (Thwaites) Tirveng.

1. *Aidia cochinchinensis* Lour.

Aidia cochinchinensis Lour., Fl. Cochinchin. (1790) 143; Masam., Trans. Nat. Hist. Soc. Formosa 28 (1938) 118, excl. syn.; Yamazaki, J. Jap. Bot. 45 (1970) 338; Wong, Malayan Nat. J. 38 (1984) 10, p.p.; Tirveng. & Sastre, Bull. Mus. Natl. Hist. Nat., B, Adansonia, 4e sér., 8 (1986) 261. — *Fagraea cochinchinensis* (Lour.) A. Chev., Cat. Pl. Jard. Bot. Saigon (1919) 6. — *Randia cochinchinensis* (Lour.) Merr., Trans. Am. Phil. Soc. n.s. 24 (1935) 365. — Type: *Loureiro s. n.* (BM), Cochinchina.

Randia oxyodonta Drake var. *microdonta* Pitard in Fl. Gén. Indo-Chine 3 (1923) 243. — Lectotype (Tirvengadum & Sastre, 1986): Eberhardt 2741 (n.v.), Vietnam.

Shrub or tree up to 15 m. Stipules triangular, 3–5 mm long. Leaves elliptic, 9–15 by 3–5 cm, coriaceous, above and below glabrous, apex and base acute, lateral nerves 5–7 pairs. Petiole up to 1 cm. Inflorescences appearing leaf opposed, up to 6 cm long, usually with 3 main branches, basically dichasial. Flowers 5-merous, calyx and hypanthium 4 mm long, glabrous, calyx campanulate, 2 mm long, lobes denticulate. Corolla tube 3–4 mm long, outside glabrous, inside densely hairy in the upper 1/3 and throat, lobes 5–6 mm long, outside glabrous, reflexed, anthers 4–6 mm long, hairy on the back, filaments short. Style 5–7 mm long, stigma linear, 5 mm long. Fruits globose, 4–6 mm diameter.

Distribution — Vietnam, China (Hainan).

Note — The only Chinese material I have seen, *F. C. How* 73391, Hainan (A), only has young buds.

Representative materials: see Tirvengadum & Sastre (1986).

2. *Aidia chantonea* Tirveng.

Aidia chantonea Tirveng. in Tirveng. & Sastre, Bull. Mus. Natl. Hist. Nat., B, Adansonia, 4e sér., 8 (1986) 272. — Type: *Pierre* 154 (L iso), Vietnam.

Shrub or tree up to 18 m. Stipules triangular, 4–8 mm long, apex acute. Leaves elliptic, 10–22 by (2–)4–9 cm, coriaceous, above and below glabrous, often drying dark brown, apex acute to acuminate, base acute, lateral nerves 6–9 pairs. Petiole up to 1.5 cm. Inflorescence appearing leaf opposed, up to 5 cm long. Flowers 5-merous, (sub)sessile, calyx and hypanthium 2–3 mm long, glabrous or with a few scattered hairs, calyx campanulate, 1–1.5 mm long, lobes shallowly triangular. Corolla tube 2–4 mm long, outside glabrous, inside densely hairy in the throat, lobes 4–6 mm long, glabrous or with a few scattered hairs, reflexed, anthers elongate, 4–5 mm

long, filaments short. Style 3–5 mm, stigma elongate, 5–6 mm long. Fruit globose, 4–6 mm diameter.

Distribution — Cambodia, Vietnam, Thailand, eastwards to India (Assam).

Representative materials, additional to those cited by Tirvengadum & Sastre 1986: India: Assam, Koelz 28123; Sastry BSI(EC) 40903. — Thailand: Beusekom & Geesink 3313; Bunchai 1831; Geesink & Santisuk 4884, 4891; Hansen et al. 11180, (Fl. Thail. 40601) 11321; Koyama et al. T. 33959; Larsen et al. 3116; Maxwell 74-850; Nimanong & Phusomaeng (Fl. Thail. 41883) 287; Phengnaren (Fl. Thail. 41549); Shimizu et al. T. 23480.

3. *Aidia oxyodonta* (Drake) Yamazaki

Randia oxyodonta Drake in Morot, J. Bot. 9 (1895) 218; Pitard in Fl. Gén. Indo-Chine 3 (1923) 243. — *Aidia oxyodonta* Yamazaki, J. Jap. Bot. 45 (1970) 338; Tirveng. & Sastre, Bull. Mus. Natl. Hist. Nat., B, Adansonia, 4e sér., 8 (1986) 271. — Lectotype (Tirvengadum & Sastre, 1986): *Balansa* 2643 (L iso), Tonkin.

Tree 6–7 m. Stipules narrowly triangular, 5–6 mm long, the apex long acuminate. Leaves elliptic, 7–16 by 3–5 cm, coriaceous, above and below glabrous, apex acute to acuminate, base acute, lateral nerves 7–10 pairs. Petiole up to 1 cm long. Inflorescence appearing leaf opposed, basically dichasial, up to 5 cm long. Flowers 5-merous, pedicel short, glabrous, calyx and hypanthium 6–8 mm long, glabrous, calyx 4–5 mm long, lobes narrowly triangular to subulate, up to 2 mm long. Corolla tube 4–5 mm long, outside glabrous, inside densely hairy in the upper 1/3 and throat, lobes 9–10 by 3–4 mm, reflexed, anthers linear, 7–9 mm long, filaments short. Style 5–9 mm, stigma linear, 8 mm long, bifid at least at apex. Fruits globose, 7–8 mm diam.

Distribution — Vietnam, China.

Representative materials: China: Hainan, Wang 34306; Kwangtung, Liang 69428, 69536; Tsang 27405, 27492; Tso 34306.

4. *Aidia pycnantha* (Drake) Tirveng.

Randia pycnantha Drake in Morot, J. Bot. 9 (1895) 218; Pitard in Fl. Gén. Indo-Chine 3 (1923) 243. — *Aidia pycnantha* Tirveng., Nord. J. Bot. 3 (1983) 455; Tirveng. & Sastre, Bull. Mus. Natl. Hist. Nat., B, Adansonia, 4e sér., 8 (1986) 271. — Lectotype (Tirvengadum & Sastre, 1986): *Balansa* 2642 (K iso), Tonkin.

Randia acuminatissima Merr., Philipp. J. Sc. 15 (1919) 259; Anon., Icon. Corm. Sinic. 4 (1975) 234, t. 5881. — *Aidia acuminatissima* (Merr.) Masam., Trans. Nat. Hist. Soc. Formosa 29 (1939) 238. — Type: Lévine 3130 (A), China, Kwangtung.

Randia pycnantha var. *grandiflora* Pitard in Fl. Gén. Indo-Chine 3 (1923) 244. — Type: Bon s.n. (n.v.), Annam.

Tree up to 10 m. Stipules narrowly triangular, 6–10 mm long, apex long acicular, outside pubescent. Leaves elliptic, 12–22 by 4–7 cm, coriaceous, above glabrous, below sparsely to densely hairy, particularly on the veins, apex and base acute, lateral nerves 9–12 pairs. Petiole up to 1.5 cm long. Inflorescence appearing leaf opposed, basically dichasial, up to 6 cm long. Flowers 5-merous, calyx and hypanthium 4–5 mm long, outside sparsely to densely ferruginous hairy, calyx 3 mm, lobes triangular, keeled along the mid-line, corolla tube (2–)3–5 mm long, outside glabrous, inside densely tomentose in the throat, lobes 7–8 mm long, reflexed, out-

side glabrous or with a few scattered hairs, anthers 6–7 mm long, filaments short. Style 3–6 mm, stigma 6–7 mm, elongate. Fruit globose 5–8 mm diam.

Distribution — Vietnam, China, Hong Kong.

Representative materials: China: Ching 7053, 7351; Chow 78480; Chun 4951; Chun & Tso 43806, 43957; Ging 15040; Guoliang 15449; How 73191; Lau 857, 1334, 1444, 1841, 2448, 2876, 3575, 5066, 26049, 26741; Levine 3276; Liang 62348, 63265, 66467; Steward & Cheo 823; Ting 1586; Tsang 16127, 17135, 21615, 23096, 26789; Tsian 58; Tsui 567; Wang 33565, 34468, 35054, 39042; Ying 1168. — Hong Kong: Tutcher 650.

5. *Aidia henryi* (E. Pritz.) Yamazaki

Randia henryi E. Pritz., Bot. Jahrb. 29 (1901) 581; Steward, Vasc. Pl. Lower Yangtze (1958) 369.

— *Aidia henryi* (E. Pritz.) Yamazaki, J. Jap. Bot. 45 (1970) 338; Tirveng. & Sastre, Bull. Mus. Natl. Hist. Nat., B, Adansonia, 4e sér., 8 (1986) 270. — Lectotype (Tirvengadum & Sastre, 1986): Henry 8924 (K, A). Syntypes: Bock von Rothorn 275, 282 (n.v.), China, Szechuan.

Randia densiflora auct.: Matsum., Bot. Mag. Tokyo 15 (1901) 3; Matsum. & Hayata, J. Coll. Sci. Univ. Tokyo 22 (1906) 190

Randia acutidens Hemsley & Wilson, Kew Bull. Misc. Inf. (1906) 160. — Type: Faber 194 (K), China, Szechuan.

Randia cochinchinensis auct.: Kaneh., Formosa Trees rev. ed. (1936) 680, f. 635; Steward, Vasc. Pl. Lower Yangtze (1958) 369; Li, Woody Flora of Taiwan (1963) 869, f. 351; Ohwi, Flora of Japan (1965) 825; Chao in Flora of Taiwan 4 (1978) 330, pl. 1026.

Randia nipponensis Makino, J. Jap. Bot. 20 (1944), f. 1–4; Illus. Fl. Japan (1954) 118, f. 354; New Illus. Fl. Japan (1961) 582, f. 2329. — Type: Japan, not indicated (n.v.).

Small tree to 10 m. Stipules narrowly triangular, 4–6 mm long, apex acicular. Leaves elliptic, (7–)9–12(–16) by (2–)3–4(–5) cm, coriaceous, above and below glabrous, apex and base acute, lateral nerves 5–7 pairs. Petiole up to 1.5 cm. Inflorescence appearing leaf opposed, up to 5 cm long, usually with 3 main branches, basically dichasial. Flowers 4-merous, calyx and hypanthium 3–4 mm long, glabrous, calyx 1.5–2 mm long, lobes triangular, distinctly mucronate, corolla tube 3–4 mm long, outside glabrous, inside hairy in the upper 1/3, lobes 5–8 mm long, reflexed, apex mucronate, anthers linear, 5–6 mm long, filaments short. Style 5–6 mm long, stigma linear, 6–7 mm long. Fruits globose, 3–6 mm diam.

Distribution — Thailand, Vietnam, China (Chekiang, Fukien, Kwangtung, Kweitschou, Szechuan, Yunnan), Taiwan, Japan.

Note — There is considerable variation in the length of the inflorescence which is frequently 1–3 cm long.

Representative materials: China: Bartholomew et al. 1821; Bouffard et al. 25030; Ching 1850, 1859, 1988, 2240, 2315, 2446, 2714, 2727, 8273; Chun 1299, 2727, 5618, 5691, 5995, 6780, 8329; Fang 12486; Faurie 252, 253, 426; Feng 426, 11542, 11820, 12997, 13173, 13268, 13904; Ging 16107, 16172; Handel-Mazzetti 306; Hu 446; Ko 50256; Kuo 15743; Lau 792, 1937, 2087, 2208, 2493, 3957, 4437; Liang 69428, 69517, 69536, 69681, 70048; Steward & Cheo 785; Taam 152, 702, 949; Tai T1570; Ting & Shih 642, 1038; Tsai 51609, 51818, 51868, 55102, 55321, 60086, 60139, 60224, 62147, 62237; Tsang 20061, 20289, 20888, 21091, 21617, 22118, 22358, 22560, 22980, 24090, 26286, 28629, 28914; Tso 20783; Tsui 596; Wang 149, 39103, 39125, 39330; Wilson 2957, 4093, 4423, 9927. — Hong Kong: Dunn, Herb. Hongk. 2813. — Japan: Murata et al. 951; Sasaki 324. — Taiwan: Gressitt 210; Hsu & Chuang 1781; Jih-Ching Liao 10527; Tanaka & Shimada 5384, 11158, 17781.

6. *Aidia merrillii* (Chun) Tirveng.

Randia caudatifolia Merr., Philipp. J. Sc. 23 (1923) 268, nom. illeg., non Pitard (1923). — *Randia merrillii* Chun, Sunyatsenia 2 (1934) 46. — *Aidia merrillii* (Chun) Tirveng. in Tirveng. & Sastre, Bull. Mus. Natl. Hist. Nat., B, Adansonia, 4e sér., 8 (1986) 271. — Type: McClure 9439 (A, US iso), China, Hainan.

Randia oppositifolia var. *parvifolia* (King & Gamble) Craib, Fl. Siam. Enum. 2 (1932) 107, p.p.

Tree up to 10 m. Stipules triangular, 3–4 mm long, apex long acicular, margins glabrous. Leaves narrowly elliptic, (5–)6–12 by (1–)2–3(–4) cm, coriaceous, above and below glabrous, apex long acuminate to caudate, base acute, lateral nerves 5–7 pairs, axils with glabrous domatia. Petiole up to 1 cm. Inflorescence appearing leaf opposed, up to 6 cm long, usually with 3 main branches, basically dichasial. Flowers 4-merous, calyx and hypanthium 2–3 mm long, glabrous, calyx campanulate, 1–1.5 mm long. Corolla tube 4–5 mm, outside glabrous, inside hairy in the upper 1/3, lobes 4–5 mm long, reflexed. Style 5–7 mm long, stigma elongate, 4–5 mm long, anthers elongate, 4 mm long, filaments short. Fruits globose, 3–5 mm diam.

Distribution — China (Hainan), Thailand.

Note — The materials from Thailand have 4-merous flowers and are considered to belong to this species. Further collections are required as the present material is with fruits or immature flowers.

Representative materials: China: Hainan, Chow 78446, 78481; Chun & Tso 43746, 43784, 44100; Lau 1462, 25772, 26335; Liang 62554, 62692, 63768; McClure 9564, 9572; Wang 35962. — Thailand: Geesink, Hiepko & Phengklai 7797; Hansen et al. 11137; Kerr 19286; Put 1277; Smitinand 7935; Smitinand & Robbins (Fl. Thail. 37762) 7936.

7. *Aidia salicifolia* (Li) Yamazaki

Randia salicifolia Li, J. Arnold Arbor. 24 (1943) 456. — *Aidia salicifolia* (Li) Yamazaki, J. Jap. Bot. 45 (1970) 338; Tirveng. & Sastre, Bull. Mus. Natl. Hist. Nat., B, Adansonia, 4e sér., 8 (1986) 271. — Type: Wang 40398 (A), China, Kwangsi.

Shrub. Stipules triangular, 6–7 mm long, apex acicular. Leaves narrowly elliptic to lanceolate, (8–)13–20 by (1–)2–3 cm, coriaceous, above and below glabrous, apex acuminate, base acute to cuneate, lateral nerves 9–11 pairs, axils with glabrous domatia. Inflorescence appearing leaf opposed, 0.5–1 cm long, with 3 short branches. Flowers unknown. Fruit globose, 6 mm diam., pedicels short, up to 3 mm.

Distribution — China (Kwangsi).

Note — Only known with certainty from the type. Steward, Chiao & Cheo 544, 806 from Kweichow Prov. may belong to this species; however, the leaves are much broader.

8. *Aidia yunnanensis* (Hutch.) Yamazaki

Randia yunnanensis Hutch. in Sargent, Pl. Wilson. 3 (1917) 400. — *Aidia yunnanensis* (Hutch.) Yamazaki, J. Jap. Bot. 45 (1970) 338; Tirveng. & Sastre, Bull. Mus. Natl. Hist. Nat., B, Adansonia, 4e sér., 8 (1986) 272. — Type: Henry 11750 (A holo), China, Yunnan.

Shrub or small tree to 5 m. Stipules narrowly triangular, 4–6 mm long, usually slightly pubescent. Leaves elliptic, 7–14 by (1.5–)2–5(–6) cm, chartaceous, above gla-

brous, below slightly pubescent particularly on the nerves, rarely glabrous, apex and base acute, lateral nerves 5–7 pairs. Petiole up to 0.5 mm long. Inflorescence appearing leaf opposed, short and compact, up to 1 cm long. Flowers 4-merous, calyx and hypanthium 3 mm long, puberulous to hairy, calyx campanulate, 1.5 mm long, lobes broadly triangular. Corolla tube 3–4 mm, outside glabrous, inside densely hairy in the throat, lobes 4–5 mm long, glabrous, reflexed, anthers elongate, 4 mm long, filaments short. Style 4–5 mm, stigma elongate, 4 mm. Fruits globose, 4–6 mm diam., pedicels short up to 3 mm.

Distribution — China (Hupeh, Szechuan, Yunnan).

Representative materials: China: Chiao & Fan 236; Ho-ch'ang Chow 1813; Koyama et al. 298; Rock 2350, 2370; Wang 74545, 74837, 76380, 77906, 78122, 79375, 79398, 79469, 79716, 80037, 80217, 80293.

9. *Aidia borneensis* Ridsdale, spec. nov. — Fig. 1

Arbores 5–15 m altae. Stipulae triangulares (2–)3–6 mm longae, apice longissime acuminate. Folia elliptica (9–)10–15(–25) cm longa et (2–)3–5 cm lata, membranacea, utrinque glabra, raro infra ad nervos pubescentia, apice acuta vel acuminata, basi cuneata, nervis lateribus 8–12 paribus, petiolo usque ad 1 cm longo. Inflorescentia usque ad 10 cm longae, ramis scorpioides. Flores 5-meri. Calyx et hypanthia c. 3 mm longa, hirsuta. Calyx cupularis 1 mm longa, minute denticulata. Tubus corollus 4–5 mm longe, extus glabrus, interiore in parte superiori hirsuto, lobis 5–6 mm longis, reflexis. Stylus 5–7 mm longus, stigma 6–9 mm longa, porcata. Antherae linear-elongatae, 4–5 mm longae. Fructus globosus, 4–5 mm diametro. — Typus: S 32384 (Wright & Ismawi) (L holo; BO, K, KEP, SAN, SING iso), Borneo (Sarawak).

Tree 3–10 m, bark pale, smooth, inner bark yellowish. Stipules triangular, (2–)3–6 mm long with a long acuminate apex. Leaves elliptic, (9–)10–15(–25) by (2–)3–5 cm, membranous, above and below glabrous, rarely pubescent on the nerves, apex acute to acuminate, base cuneate, lateral nerves 8–12 pairs. Petiole up to 1 cm long. Inflorescence at a leaf bearing node, appearing leaf opposed, up to 10 cm long, usually with 3 major branches, basically cincinnoid, axis thin, russet pubescent. Flowers 5-merous, calyx and hypanthium c. 3 mm, with small stiff hairs, these often drying rufous brown, calyx cupular, 1 mm, minutely denticulate. Corolla tube 4–5 mm, outside glabrous, inside with a ring of hairs in the upper 1/3, protruding from the throat, lobes 5–6 mm long, reflexed, outside glabrous, anthers linear-elongate 4–5 mm long, transversely locellate, filaments 1.5–2 mm. Style 5–7 mm long, stigma 6–9 mm long, ridged. Fruits globose, 4–5 mm diam.

Distribution — Borneo (Brunei, Kalimantan, Sabah, Sarawak).

Habitat — Recorded from kerangas forest and ultrabasic.

Representative materials: Borneo: Agama 494; Amdjah 195, 253; Ashton (BRUN) 76; Castillo (?P.B.S.) 600; Clemens 9462, 9863, 21741, 26417, 27670, 29365; Darnton 133; Enderi 3305, 3347; Gibbs 4290; Haviland 1380; Haviland & Hose 3193; Hose 125; Kondo & Edaño (PNH) 38733; Kostermans 21099, 21383, 21464; Moulton 37; Ogata 11053, 11574; Puff et al. 9000817-1/3; Ramos 1396; Richards 1221; S(arawak) 18964, 21108, 23294, 31510, 32384, 33149, 34992, 40637, 41989, 43040, 43046; SAN 17115, 20622, 20938, 21019, 24148, 24180, 25348, 25764, 26529, 27268, 27455, 28841, 31897, 41481, 44327, 49171, 59586, 62287, 63287, 66598, 67182, 67955, 77435, 78400, 83876, 88350, 90618, 90826, 94343, 95620, 96341, 96049, 96068, 96643,

100107, 101416, 102170, 109370, 109755, 110807, 110881, 113282, 116035, 116081, 117527, 118992, 123127; SAN-NBFD 1875 (Mendoza), 2321 (Otik), 3856 (Puasa-Angian), 10394 (Endrai & Enggoh); Sinclair & Kadim 9247; Tahir 713; Valkenburg 1074; Wiriadinata 609, 656, 833; Wong WKM 1689; Wood 774, 863; Yates 38.



Fig. 1. *Aidia borneensis* Ridsdale. Habit (SAN 96068).

10. *Aidia pseudospicata* Ridsdale, spec. nov.

Arbores. Stipulae triangularis 5–7 mm longae, apice longe acuminatae. Folia late elliptica, (8–)15–20 cm longa et 4.5–9 cm lata, aliquantum coriacea, utrinque glabra, nervis lateralibus 5–8 paribus, petiolo usque ad 1 cm longo. Inflorescentia usque ad 4 cm longa, dense pubescentia, ramis scorpioideis, foliis opposita. Flores 5-meri, subsessilis. Calyx et hypanthia 4 mm longa. Calyx campanulata, 2 mm longa, lobis denticulatis. Tubo corollam 4–5 mm longo, extus glabro, interiore in parte superiore tomentoso, lobis 8–10 mm longis, reflexis, glabris. Antherae 8–9 mm longae, apiculatae. Stylus 4–6 mm longus, stigma 7–9 mm longa, porcata. Fructus globosus, 8 mm diametro. — Typus: *King's collector s.n.* (K holo), India, Assam; date stamp on label is 2 May 1898.

Small tree, sometimes growing as an epiphyte. Stipules triangular, 5–7 mm long, apex long acuminate, margins glabrous. Leaves broadly elliptic, (8–)15–20 cm by 4.5–9 cm, somewhat coriaceous, above and below glabrous, apex acuminate, base obtuse, lateral nerves 5–8 pairs. Petiole up to 1 cm. Inflorescence appearing leaf opposed, up to 4 cm long, usually with 3 main branches, basically cincinnoid, densely pallidly pubescent. Flowers 5-merous, subsessile, calyx and hypanthium 4 mm long, slightly pubescent, calyx campanulate, 2 mm long, lobes denticulate. Corolla tube 4–5 mm, outside glabrous, inside with dense hairs in the upper 1/3, these protruding from the throat, corolla lobes 8–10 mm long, reflexed, glabrous, anthers 8–9 mm long, filaments c. 1 mm, apiculate. Style 4–6 mm, stigma 7–9 mm long, ridged. Fruits globose, 8 mm diam.

Distribution — India (Assam).

Representative materials: *Keenan s.n.* Cachar 2 collections (K).

11. *Aidia racemosa* (Cav.) Tirveng.

Stylocoryna racemosa Cav., Icon. 4 (1798) 45, t. 368. — *Randia racemosa* Fern.-Vill., Nov. App. (1880) 108, comb. illeg., non Roxb. — *Webera racemosa* (Cav.) Boerl., Handl. Fl. Ned. Indië (1891) 129. — *Aidia racemosa* (Cav.) Tirveng. in Tirveng. & Sastre, Bull. Mus. Natl. Hist. Nat., B, Adansonia, 4e sér., 8 (1986) 262. — Type: *L. Nee s.n.*, 1793 (MA, n.v.), Philippines, Manila.

Gynopachis axilliflora Miq., Fl. Ind. Bat. 2 (1856) 221. — Type: *Horsfield* 63 (K), Java.

Ixora thozetiana F. Muell., Fragm. 2 (1860/61) 132. — *Aidia thozetiana* (F. Muell.) Tirveng. in Tirveng. & Sastre, Bull. Mus. Natl. Hist. Nat., B, Adansonia, 4e sér., 8 (1986) 272. — Lectotype (Tirvengadum & Sastre, 1986): *Thozat s.n.* (K? n.v.), Australia, Rockhampton.

Randia densiflora auct. non Benth.: Koord. & Valeton, Bijdr. Booms. Java 8 (1902) 93.

Randia spicata Valeton, Nova Guinea 8 (1911) 468. — *Aidia spicata* (Valeton) Tirveng. in Tirveng. & Sastre, Bull. Mus. Natl. Hist. Nat., B, Adansonia, 4e sér., 8 (1986) 271. — Type: *Branderhorst* 143 (L holo; BO iso), New Guinea.

Randia oppositifolia auct. non Schmidt: Koord., Exk. Fl. Java 3 (1912) 237; Koord.-Schum., Syst. Verz. 2 (1913) fam. 270, 83.

?*Randia suishaensis* Hayata, Icon. Pl. Form. 9 (1920) 59. — Type: *Hayata s.n.*, 1916 (TO, n.v.), Taiwan.

Randia lamprophylla O. Schwarz, Repert. Sp. Nov. Reg. Veg. 24 (1927) 100. — Type: *Bleeser* 590 (n.v.), Australia.

Randia cochinchinensis auct. non (Lour.) Merr.: Backer & Bakh. f., Fl. Java 2 (1965) 312.

Trees up to 15(–25) m. Stipules triangular, 2–5 mm long. Leaves elliptic, (5–)8–15 (–20) by (2–)2.5–4(–7) cm, coriaceous, above and below glabrous, apex acute, base acute to obtuse, lateral nerves (4–)6–9 pairs. Inflorescence appearing leaf opposed,

up to 6(–10) cm long, basically cincinnoid, axis glabrous, or slightly russet pubescent. Flowers 5-merous. Calyx and hypanthium 2–3.5 mm long, glabrous, calyx 1–2 mm, lobes denticulate to shallowly triangular. Corolla tube 3–5 mm long, outside glabrous, inside densely hairy in the upper 1/3 and throat, lobes (4–)5–7 mm, glabrous, reflexed, anthers linear 5–7 mm long, reflexed, filaments short. Style 5–7 mm, stigma linear 6–8 mm. Fruit subglobose, 4–8 mm diam.

Distribution — China (Hainan), Thailand (Peninsular), Malay Peninsula, Christmas Is., Java, Lesser Sunda Islands, Celebes, Philippines, Moluccas, New Guinea, Solomon Islands (Guadacanal, Nggela, Rennell), Australia.

Note — In Java, the Malay Peninsula and Thailand apparently restricted to limestone.

Representative materials: China: Hainan, Chun & Tso 44597, 44740, 44782; How 71791; Lau 327, 1182, 1806, 4961, 5128; Liang 63314, 63959. — Thailand: Kerr 15536. — Philippines: Adduru 47; BS (Bur. Sci.) 375, 1054, 1408, 1830, 8090, 21533, 21622, 27372, 41045, 41283; Clemens 1193; Curran & Merrit 7631; Ebalo 167; FB (For. Bur.) 1472, 2047, 15086, 24983; Loher 6325; Merrill 1248, 2219, 2789, 3054, 9307; PNH 12307, 12437, 17017, 18060, 38846; Vidal 1697; Weber 73. — Malay Peninsula: FRI 755, 4249, 12159, 14538, 15632; KEP 85209; Ogata 110291; SFN 35279; Soepadmo & Mahmud 1238; UNESCO Limestone Exped. 3, 17. — Christmas Island: Mitchell 41; Powell 34. — Java: Afriastini 1496; Buwalda 3130; Hoogerwerf 7, 10; Karta 272; Koorders 12977, 30068; Forbes Pl. Java 461. — Lesser Sunda Islands: bb 10332; Bloembergen 3690; Elbert 4645; Iboet 236; Jaag 796, 815; Kostermans 18678, 22005; Kostermans & Wirawan 52, 924; Kuswata 103, 227, 263; Schmutz 1125, 3675, 4337, 4779A, 5024; Verheijen 452B, 2762, 3295. — Celebes: Ned. Ind. For. Serv. Cel/I-53. — Moluccas: Buwalda 4589; Jensen 386; Taylor, P.M. 367, 525. — Tenimber Islands: bb 24348. — New Guinea: Brass 6487, 8590; Carr 11238; Frodin UPNG 1966, 4340; Gebo UPNG 425; Gillison 53; Heyligers 1197; NGF 13128, 22167A, 26168, 36402, 43709; Pullen 6653, 6773; Schodde 2730, 2777; Soegeng 226; van Royen 10764. — Solomon Islands: BSIP 9262, 12346, 12462, 14956, 15002, 15123, 15410. — Australia: Brass 18594, 19114; Brown, R. 3464; Cook 3643; Coveny 6904; Dunlop 3393; Dunlop & Byrnes 2123; George 12814; Gittins 2703; Hyland 4275, 6651, 7000, 7461, 8249; Irvine 266; Jessup 651; Kenneally 5136; 8344, 8977; Lazarides 7597; Lazarides & Adams 178, 287; Parker 178; Puttock UNSW 14268; Schultes 702; Schultz 631; Smith 3294, 10584, 10629; Specht 263; Telford & Butler 6148.

12. *Aidia densiflora* (Wall.) Masam.

Webera densiflora Wall. in Roxb., Fl. Ind. ed. 1, 2 (1824) 536. — *Cupia densiflora* (Wall.) DC., Prodr. 4 (1830) 394. — *Stylocoryne densiflora* (Wall.) Steud., Nom. Bot. 2 (1841) 649. — *Randia densiflora* (Wall.) Benth., Fl. Hongkong (1861) 155. — *Webera oppositifolia* Roxb. var. *densiflora* (Wall.) Kurz, For. Fl. Brit. Burma 2 (1877) 47. — *Aidia densiflora* (Wall.) Masam., Sci. Rep. Kanazawa Univ. 4 (1955) 85, nom. illeg. — *Aidia cochinchinensis* auct. non Lour.: Wong, Malayan Nat. J. (1984) 10. — *Aidia wallichiana* (Wall.) Tirveng. in Tirveng. & Sastre, Bull. Mus. Natl. Hist. Nat., B, Adansonia, 4e sér., 8 (1986) 263, nom. superfl. (Code Art. 63.3). — Lectotype (Tirvengadum & Sastre, 1986): *Wallich* 8408 (WALL-K), Malaysia, Penang.

Webera oppositifolia Roxb., Fl. Ind. ed. 1, 2 (1824) 535. — *Cupia oppositifolia* (Roxb.) DC., Prodr. 4 (1830) 394. — *Randia oppositifolia* (Roxb.) Koord., Exkursfl. Java 3 (1912) 257. — Type: *Roxburgh* s.n., Chittagong, not traced.

Gynopachis attenuata Korth., Ned. Kruidk. Arch. 2 (1851) 182. — Type: *Korthals* s.n. (L 908.223-1066), Sumatra.

Gynopachis oblongata Miq., Fl. Ind. Bat. 2 (1856) 221. — *Aidia oblongata* (Miq.) Tirveng. in Tirveng. & Sastre, Bull. Mus. Natl. Hist. Nat., B, Adansonia, 4e sér., 8 (1986) 271. — Lectotype: *Junghuhn* s.n. (L 908.223-199), Sumatra.

Urophyllum coriaceum Miq., Fl. Ind. Bat. Suppl. 1 (1861) 542. — *Aidia coriacea* (Miq.) Tirveng. in Tirveng. & Sastre, Bull. Mus. Natl. Hist. Nat., B, Adansonia, 4e sér., 8 (1986) 268. — Type: *Teijsmann s. n.* (?BO, vide Tirvengadum, n.v., not traced with certainty), Sumatra, Lebu Lahat. *Stylocoryne dimorphophyla* Teijsm. & Binnend., Nat. Tijdschr. Ned. Indië 25 (1863) 402. — Type: *Teijsmann s. n.* (BO), Indonesia, Baleh-Balehang.

Randia gardneri auct. non (Thwaites) Hook.f.: Gamble, Fl. Madras 2 (1921) 617, p.p.

Small to large tree attaining 15–20 m. Bark smooth, lenticellate or slightly cracking, greyish brown, inner bark pale brown, darkening on exposure; sapwood pale yellow. Stipules triangular, 5–6 mm, apex usually acuminate. Leaves (narrowly-)elliptic, (9–)12–18(–25) by (2.5–)4–7(–9) cm, chartaceous, above and below glabrous, apex acute, base obtuse to acute, lateral nerves 6–12 pairs. Petiole up to 1.5 cm long. Inflorescence appearing leaf opposed, up to 5 cm long, usually with 3 main branches, basically dichasial. Flowers 5-merous, pedicels densely finely pubescent, calyx and hypanthium 3–3.5(–4.5) mm long, calyx campanulate, 2–2.5(–3.5) mm long, lobes deltoid, corolla tube 2–4 mm long, outside glabrous, inside with hairs at the throat, lobes (3–)4–6 mm long, reflexed, outside with a line of hairs on the mid-line, rarely with only a few hairs, 0.2 mm, anthers linear, 4–6 mm long, filaments short. Style 3–4 mm, stigma 5–6 mm, clavate. Fruits globose, c. 5 mm in diam., ripening yellow to red and then black.

Distribution — India (Kerala, NE India, exact distribution unknown, Andaman Islands), Burma, Thailand, Malay Peninsula, Sumatra, Riouw Archipelago, Borneo (Kalimantan, Sarawak).

Habitat — Secondary and primary forest.

Note — The exact distribution in India is uncertain; one specimen, *Beddome s. n.*, Travancore (Kerala), annotated by Gamble as ‘*R. Gardneri*’, is considered to represent this species. In NE India it is difficult to separate the present species from *A. chantonea* without presence of mature flowers

Nomenclature — Masamune’s combination was illegitimate as it included types of *A. cochinchinensis*, *A. racemosa* and *A. oppositifolia* combined in one broad species. However, Tirvengadum recognised the first two species as distinct from *A. densiflora*, as is the case in the present treatment. The name *A. wallichiana* Tirveng. is superfluous, see Art. 63.3.

Representative materials: India, South: Bourdillon 155. — Andaman Islands: Balakrishnan 31; Balakrishnan & Nair 3594; Bhargava 3390; Mondi 204; Nair 808; Parkinson 392; Prain 20. — Burma: Helfer, Kew Dist. 2786, 2962. — Thailand: Chardenphol et al. 3924; Geesink et al. 7439; Geesink & Santisuk 5388; Hansen & Smitinand 12557; Kerr 11215, 14021, 16841, 18506; Koyama et al. T-33998; Larsen 32770, 33564; Maxwell 73-34, 76-791, 77-129, 85-1102, 86-117, 86-541, 87-673; Phusomsaeng 85, 126; Put 1561; Soejarto et al. 5883. — Malay Peninsula (see Tirvengadum, 1986; Wong, 1984, under ‘cochinchinensis’): Carrick 1636; Curtis 923; FRI 77, 588, 635, 743, 3038, 3098, 3443, 4363, 4500, 6705, 6768, 6890, 7665, 8554, 11243, 11340, 11863, 12557, 12868, 13666, 13731, 14579, 15833, 16687, 20477, 21714, 23381, 25743, 26245, 28010, 28335, 28614, 29070, 29449, 31513; Kadim & Mahmood KM 74; KEP 97752, 98587, 100147, 104919, 115683; King’s coll. 8574; Ogata 10323; Phytol. Surv. Mal. K.L. 283, 1310, 1936, 2566, 3043, 3112; Soepadmo 842, 876. — Sumatra: bb 6464; Burley 1285, 1636; Dumas 1639; Endert 81TIP-184, 156EIP-848; Forbes Pl. Sum. 3040, 3070, 3078A; Laumontier YL 6316; Lörzing 4720, 5553, 5612; Meijer 3304, 6826, 7159; Rahmat si Toroos 3968, 4048; Rochardi 683; de Wilde 14547, 19593, 20703; Wiriadinata & Maskuri 514; Yates 1340. — Borneo: bb 14400; Bujang 12987; Kostermans 9814; Mandi 204; Paie 8324, 13310, 13606; S(arawak) 13449, 21509, 34648, 35245, 35987, 37946, 45677, 46965; Shea 26992, 27206, 27298, 27303, 27304; Wiriadinata 1219.

Deviating material: Jacobs 4603, Meijer 5270, Lubuk Bangku, Pajakumbuh, Sumatra, 15-8-1956.

Shrub. Leaves 5–7 by 1–1.5 cm, apex acuminate, base acute. Inflorescences highly immature.

Habitat — Sandstone.

Note — The leaf size is completely out of the range of *A. densiflora* and the material is superficially similar to *A. merrillii* from Thailand.

13. *Aidia parvifolia* (King & Gamble) Wong

Randia densiflora var. *parvifolia* King & Gamble, J. As. Soc. Beng. 72, ii (1903) 209. — *Randia oppositifolia* var. *parvifolia* (King & Gamble) Craib, Fl. Siam. Enum. 2 (1932) 107, p. p. — *Aidia parvifolia* (King & Gamble) Wong, Malayan Nat. J. 38 (1984) 16; Tirveng. & Sastre, Bull. Mus. Natl. Hist. Nat., B, Adansonia, 4e sér., 8 (1986) 271. — Lectotype (Wong, 1984): *Curtis* 796 (SING, n.v.; K iso), Malaysia, Penang.

Small tree up to 10 m. Stipules triangular, 4–6 mm long with a long acuminate apex, margins ciliate. Leaves narrowly to broadly elliptic, (8–)10–16 by (2–)3–6 cm, often coriaceous, above and below glabrous, apex acuminate, base acute or less frequently obtuse, lateral nerves 5–8 pairs. Petiole up to 1 cm. Inflorescences appearing leaf opposed, up to 4 cm long, usually with 3 main branches, basically dichasial. Flowers 5-merous, pedicels densely finely pubescent, calyx and hypanthium 6 mm long, finely hairy, calyx campanulate, lobes denticulate. Corolla tube 3–4 mm, outside glabrous, inside with a dense ring of hairs in the upper 1/3, protruding from the throat, lobes reflexed, (3–)4–5 mm long, outside densely pallidly pubescent, anthers elongate, 4–5 mm long, filaments short, 0.2 mm. Style 5–7 mm, stigma elongate, 5–6 mm long, ridged, becoming bifid for c. 3 mm. Fruits not seen

Distribution — Burma, Thailand, Malay Peninsula

Note — Fruiting material cannot be identified with certainty as it is not possible to separate from *A. densiflora*.

Representative materials: Thailand: Beusekom & Phengklai 813; Hansen & Smitinand 12247; Koyama et al. T-33770, T-33791; Larsen 33385. — Malay Peninsula (see Wong, 1984): King's coll. 1585; Rahim 35.

14. *Aidia gardneri* (Thwaites) Tirveng.

Griffithia gardneri Thwaites, Enum. Pl. Zeyl. (1859) 158. — *Randia gardneri* (Thwaites) Hook. f., Gen. Pl. 2 (1873) 88; Fl. Brit. India 3 (1880) 112; Trimen, Handb. Fl. Ceyl. 2 (1894) 331. — *Aidia gardneri* (Thwaites) Tirveng., Bull. Mus. Natl. Hist. Nat. Paris, sér. 3, Bot. 35 (1978) 11.

— Type: Thwaites C.P. 657 (PDA holo; K iso), Sri Lanka.

Randia laurifolia Hook. f., Gen. Pl. 2 (1873) 88, nom. nud.

Trees attaining 30 m. Stipules band-shaped and mucronate. Leaves narrowly elliptic, (6–)8–12 by (1–)2–3(–3.5) cm, above and below glabrous, apex attenuate to caudate, sometimes falcate, base attenuate, lateral nerves 4–6 pairs, somewhat obscure in lamina. Petiole 0.5–1 cm. Inflorescence appearing leaf opposed, up to 6 cm long, usually with 3 main branches, basically cincinnoid. Flowers 5-merous, pedicel long,

10–15 mm, glabrous. Calyx and hypanthium 4–6 mm, with scattered fine hairs, calyx cupulate, 2–4 mm, minutely denticulate, corolla rotate, tube 2–4 mm, outside glabrous, inside densely hairy in the upper 1/3, lobes 6–7 mm, outside with a fine line of hairs on the midline, reflexed. Style 6–8 mm, stigma 4 mm, clavate, anthers elongate, 6–8 mm long, filaments short. Fruit globose, 5–10 mm diam., orange-yellow turning black.

Distribution — Endemic to Sri Lanka. Gamble's references to this species from Peninsular India are errors of identification.

Representative materials: Sri Lanka: *Balakrishnan & Jayasuriya NBK* 879, 914; *Cramer* 4999; *Jayasuriya* 1251; *Meijer* 1293; *Kostermans* 23327, 24196, 25474, 27627, 28381, 28408, 28460; *Tirvengadum & Balasubramanium* 319; *Thwaites CP* 657, 3422; *Waas* 769, 1074, 1279, 1361, 1568; *Waas & Peerlis* 548; *Worthington* 1606, 2209, 5270, 6695.

15. *Aidia graeffei* (Reinecke) Tirveng.

Randia graeffei Reinecke, Bot. Jahrb. 25 (1898) 683. — *Aidia graeffei* (Reinecke) Tirveng. in Tirveng. & Sastre, Bull. Mus. Natl. Hist. Nat., B, Adansonia, 4e sér., 8 (1986) 270. — Types: Reinecke s.n., 10-1894, 153, Graeffe 98, 120 (n.v.), Samoa.

Randia graeffei var. *alba* Reinecke, Bot. Jahrb. 25 (1898) 683. — Types: Reinecke 160, 175, Graeffe 1409 (n.v.), Samoa.

Randia gaudichaudii Valeton in Lecomte, Not. Syst. 3 (1914) 54. — Type: *Gaudichaud* s.n. (P), Moluccas, Rawak.

Randia cochinchinensis auct. non Merr.: Fosberg, Occ. Pap. Bish. Mus. 15 (1940) 216; Stone, Micronesica 6 (1971) 558.

Aidia cochinchinensis auct. non Lour.: Flora Micronesia 5 (1993) 46.

Shrubs or small trees attaining 15 m. Stipules triangular, 4–6 mm long with an acuminate apex. Leaves (narrowly-)elliptic, (6–)10–16(–20) by (2.5–)3–6(–8) cm, above and below glabrous, apex acute, base acute, lateral nerves 6–8 pairs. Petiole up to 1.5 cm. Inflorescence appearing leaf opposed, up to 5 cm long, usually with 3 main branches, basically dichasial, many-flowered. Flowers 5-merous, pedicel glabrous, calyx and hypanthium 2–3 mm long, calyx short cupular, 1–1.5 mm long, outside and inside glabrous, rarely with a few scattered hairs (exceptionally densely finely hairy), margin slightly denticulate. Corolla tube 3–6 mm, outside glabrous, inside with hairs in the throat, lobes 9–12 mm long, glabrous, reflexed, anthers elongate, 7–9 mm long, filaments short, 0.2 mm. Style 4–7 mm, stigma elongate-clavate, 8–10 mm long. Fruits 4–8 mm diam.

Distribution — Moluccas (2 early collections of Reinwardt, Gaudichaud), New Guinea (1 record Arfak, Sudest Is.); Solomon Islands (Florida Is., Navotama Is., Ysabela); Pacific Islands (Marshall Is., Micronesia, Nauru Is., Belau [Palau] Is., Guam, Matiana Is., Wallis & Futuna, Western Samoa, Tonga).

Ecology — In the Pacific usually reported on limestone, in the Solomon Islands in coastal areas.

Note — The specimen from the Arfak, E. Mayr 234, was collected at 1900–2600 m according to the field label. The calyx is densely finely hairy.

Representative materials: Numerous collections from the Pacific are free of confusion. — Moluccas: ?van Borssum Waalkes 3073, fruiting. — Solomon Islands: Brass 3180, 3239, 3511; BSIP 4067.

16. A. sp.

Distribution — Australia, Queensland.

Note — I have only seen a few specimens of this species which is currently being treated by C.F. Puttock, the reason for not describing it here.

Section Randiella (Baill.) Ridsdale, comb. nov.

Randia sect. *Randiella* Baill., Adansonia 12 (1879) 295. — *Genipa* sect. *Randiella* Baill., Hist. Pl. 7 (1880) 310. — Type species: *Aidia vieillardii* (Baill.) Ridsdale.

Differs from sect. *Aidia* in the short clavate- to heart-shaped stigma and in the short ellipsoidal anthers.

17. Aidia vieillardii (Baill.) Ridsdale, comb. nov.

Randia vieillardii Baill., Adansonia 12 (1879) 295. — *Genipa vieillardii* (Baill.) Baill., Hist. Pl. 7 (1880) 310. — *Pelagodendron vieillardii* (Baill.) Tirveng., Candollea 46 (1991) 252. — Type: Vieillard 679 (n.v.), New Caledonia.

Small tree. Stipules narrowly triangular, 2–3 mm long, pallidly hairy. Leaves elliptic, 5–9 by 2–4 cm, somewhat coriaceous, above and below glabrous, apex acute, base acute, lateral nerves 6–9 pairs. Petiole up to 1 cm. Inflorescences apparently pseudo-axillary at a normal leaf bearing node, fasciculate, highly compacted up to 1 cm. Flowers 5-merous, pedicels 2–4 mm, hairy, calyx and hypanthium 3 mm long, with scattered pallid hairs, calyx campanulate, 1 mm long, margins slightly denticulate. Corolla 3–5 mm, tube 2 mm, outside glabrous, inside hairy in the upper part, lobes triangular, 2 mm, anthers 1–1.5 mm long, slightly protruding, apparently not reflexed, filaments short. Style 2 mm, stigma 1–1.5 mm, ridged, apparently bilobed. Fruit not seen.

Distribution — New Caledonia.

Note — I have only examined *Bernardi* 9651. The position of the inflorescence is unusual.

Representative materials: see Tirvengadum (1991).

18. Aidia congestum (Schltr. & Krause) Ridsdale, comb. nov.

Rhopalobrachium congestum Schltr. & Krause, Bot. Jahrb. 92 (1908) 42. — *Pelagodendron congestum* (Schltr. & Krause) Tirveng., Candollea 46 (1991) 253. — Type: Schlechter 14758 (L iso), New Caledonia.

Shrub or small tree. Stipules broadly triangular, 3–4 mm, often resinous. Leaves elliptic, 9–13 by 3–4 cm, coriaceous, above and below glabrous, apex and base acute, sometimes somewhat attenuate, lateral nerves 6–8 pairs. Petiole up to 2.5 cm. Inflorescence pseudo-axillary at a leaf bearing node, up to 2 cm, branches compacted, bracteate. Flowers 5-merous, calyx and hypanthium 4–5 mm long, calyx cupular, 2 mm long, margins slightly undulate. Corolla somewhat campanulate, 9–12 mm

long, tube 6–7 mm, outside glabrous, inside with red-brown hairs in the upper 1/3, lobes triangular, 5 mm long, apparently not reflexed. Style 7 mm, stigma 5–6 mm long, bilobed, ridged, anthers 5 mm long, slightly protruding from the throat, filaments short. Fruits not seen.

Distribution — New Caledonia.

Representative materials: see Tirvengadum (1991).

19. *Aidia brisipensis* Ridsdale, spec. nov. — Fig. 2

Arbores 5–8(–15) m altae. Stipulae anguste triangulares 5–7 mm longae. Folia elliptica (12–)15–20 cm longa et (2.5–)3–5 cm lata, utrinque glabra, apice acuta vel acuminate, basi acuta, nervis lateralibus 8–12 paribus, petiolo usque ad 1.5 cm longo. Inflorescentia usque ad 2.5 cm longae, nodis floriferis bracteatis. Flores 5-meri. Calyx et hypanthia 2 mm longa, glabra. Calyx campanulata 1 mm longa, lobi minutus denticulato. Corolla hypocra-teriforme, tubo 2–2.5 mm longo, extus glabro, interiore in parte dimidio distale tomentoso, lobis ovatis 3 mm longis, reflexis, extus glabris. Antherae ellipsoideae 1.5 mm longae. Stylus 2.5–3 mm longus, stigma clavata, longitudinaliter costulatis, bifida. Fructus 4–7 mm diametro. — Typus: BSIP (I.H. Gafui) 9365 (L holo), Solomon Islands.

Derivation of name from British Solomon Islands Protectorate = BRISIPensis.

Tree 5–8(–15) m, bark smooth, dark brown, inner bark fawn, wood yellow-brown. Stipules narrowly triangular, 5–7 mm long, slightly twisted. Leaves elliptic, (12–)15–20 by (2.5–)3–5 cm, above and below glabrous, apex acute to acuminate, base acute, lateral nerves 8–12 pairs. Petiole up to 1.5 cm. Inflorescence pseudo-axillary at a normal leaf bearing node, up to 2.5 cm long, usually with 3 main axes, glabrous with small triangular bracts. Flowers 5-merous, calyx and hypanthium 2–2.5 mm, glabrous, calyx campanulate 1 mm long, minutely denticulate; corolla salverform, tube 2–2.5 mm, outside glabrous, inside with brownish hairs in the upper 1/3, these protruding from the throat, lobes 3 mm long, reflexed, glabrous, anthers ellipsoidal 1.5 mm long, the filaments short, 0.3 mm long. Style 2.5–3 mm long, stigma clavate, 1 mm, ridged later becoming cleft. Fruits ovoidal to globose, 4–7 mm diam., crowned by the calyx remnants.

Distribution — Solomon Islands (Guadalcanal, New Georgia, Nggela, San Cristobel).

Representative materials: Solomon Islands: BSIP 3247, 3719, 3844, 5936, 7455, 9722, 11261, 12140, 12817, 12820, 15195.



Fig. 2. *Aidia brisipensis* Ridsdale. Habit (BSIP 9365).

20. *Aidia waugia* Ridsdale, spec. nov.

Arbores gracilis 5–15 m altae. Stipulae anguste triangulares, 7–11 mm longae. Folia elliptica 12–17 cm longa et 4–8 cm lata, utrinque glabra, apice acuta, basi acuta interdum inaequalia, nervis lateralibus 7–9 paribus, petiolo usque ad 1 cm longo. Inflorescentia anti-stipulosae usque ad 5 cm longae, cymosae, nodis floriferis bracteatis. Flores 5-meri. Calyx et hypanthia 3–4 mm longa. Calyx campanulata 2 mm longa, lobii deltati. Corolla campanulata, tubo 4 mm extus glabro, interiore in parte medio tomentoso, lobis orbicularis 3 mm longis, reflexis, extus glabris. Stylus 3–4 mm longus, stigma clavata 2 mm longa. Antherae ellipsoideae, 2.5 mm longae, apiculatae. Fructus usque ad 10 mm diametro. — Typus: NGF (Havel & Kairo) 17114 (holo-L), New Guinea.

Derivation of name from the type locality, Wau, New Guinea.

Slender tree, 5–15 m, dbh up to 20 cm, bark grey-brown, underbark green, inner bark cream; wood hard, cream. Stipules narrowly triangular, 7–11 mm long, somewhat twisted. Leaves elliptic, 12–17 by 4–8 cm, above and below glabrous, apex and base acute, sometimes unequal, lateral nerves 7–9 pairs. Petiole up to 1 cm. Inflorescence pseudo-axillary at a normal leaf bearing node, up to 5 cm long, cymose branched, nodes with triangular bracts. Flowers 5-merous, calyx and hypanthium 3–4 mm, calyx campanulate, 2 mm long, lobes deltoid, apiculate and at apex pubescent outside. Corolla campanulate, tube 4 mm long, said to be red, outside glabrous, inside with tufts of hairs in the middle of the tube, not conspicuously protruding from the throat, lobes orbicular, 3 mm, said to be cream, outside glabrous, anthers ovate to ellipsoidal, 2.5 mm long, apiculate, filaments short. Style 3–4 mm, stigma clavate, 2 mm. Fruit up to 10 mm diam.

Distribution — New Guinea.

Ecology — Mid-montane forest.

Note — This species has been referred to *Pelagodendron* by Tirvengadum, *Can-dollea* 46 (1991) 252 ('Henry & Coode 2236' must be Henty & Coode NGF 29236).

Representative materials: New Guinea: Brass 32345; Hartley 11470, 11500; Moi 95; NGF 17496, 29225, 29236, 34857.

There are two further collections from a low altitude of 20–30 m, Brass 28588, Rossel Island and 28117, Sudest Island [both distributed as *Timonius*, later determined as *Canthium*] which appear to belong to this species.

21. *Aidia glabra* (Valeton) Ridsdale, comb. & stat. nov.

Randia gynopachis var. *glabra* Valeton, Bot. Jahrb. 60 (1926) 96. — Type: Ledermann 10354 (L), New Guinea.

KEY TO THE VARIETIES

- 1a. Young stems and inflorescence branches more or less glabrous, petiole and midrib above glabrous or with a few scattered hairs a. var. *glabra*
- b. Young stems and inflorescence branches medium to densely rusty pubescent, petiole and midrib above distinctly rufous pubescent b. var. *rubiginosa*

a. var. *glabra*

Large liane. Stipules triangular, 6–10 mm long. Leaves elliptic c. 20 by 8 cm, only known from fragments, somewhat bullate, base obtuse, midrib glabrous above, below with a few scattered hairs. Petiole 0–5 mm. Inflorescence usually from a leafless node separated from a leaf bearing node by a short internode 10–15 mm long, sometimes appearing leaf opposed, corymbose, up to 6 cm long, the nodes bracteate. Flowers 5-merous. Calyx and hypanthium 7 mm long, calyx cupular, subtruncate, minutely denticulate, glabrous. Corolla somewhat infundibular, tube 8.5 mm long, outside densely rufous pubescent except for lower 0.3 mm, inside rufous villose throughout, hairs protruding from the throat, lobes 7–8 mm long, anthers ovoid, 3 mm long, filaments short. Style 8–10 mm, stigma clavate, 3 mm, grooved. Fruits unknown.

Distribution — New Guinea, only known from the type collection.

b. var. *rubiginosa* Valeton ex Ridsdale, *comb. nov.*

Randia gynopachis var. *rubiginosa* Valeton, Bot. Jahrb. 60 (1926) 88 key, 95. — Type: Schlechter 19312 (L), New Guinea.

Lianes to 18 m. Young branches medium to densely pubescent, hairs russet. Leaves elliptic, up to 25 by 12 cm, bullate, apex acute, base obtuse, midrib above with russet hairs, below russet hairy also on minor nerves. Petiole up to 1 cm. Inflorescence cymose with 3 main branches, up to 8 cm long, nodes bracteate, russet hairy. Flowers only known from very immature buds. Calyx c. 3 mm, cupular, minutely dentate. Fruits up to 5 mm diam.

Distribution — New Guinea.

Notes — The variety was described by Valeton without a Latin diagnosis, an oversight contrasting to his treatment of other species and varieties. Furthermore he cited no collections.

The collection Jacobs 9309 notes “clinging to the host tree by roots on the stem.”

Both varieties are exceedingly rare in the forest and herbarium materials are fragmentary as the leaves are prone to break up on drying.

Representative materials: New Guinea; Jacobs 9309; LAE 68490; NGF 29957; Schodde 2175.

22. *Aidia polystachya* (Valeton) Ridsdale, *comb. nov.*

Randia polystachya Valeton, Bot. Jahrb. 60 (1926) 97. — Lectotype: Ledermann 7625 (L); syn-types: Ledermann 8608 (n.v.), 8611 (n.v., drawing L), all New Guinea.

Liane. Young branches glabrous. Stipules triangular, 4–7 mm long. Leaves elliptic, 10–17 by 3–7 cm, above and below glabrous, apex acute, base obtuse to slightly subcordate, sometimes unequal, lateral nerves 10–12 pairs. Petiole up to 0.5 cm. Inflorescence, usually from a leafless node separated from the leaf bearing nodes by a short internode, with 3 main axes up to 3 cm long, nodes with small triangular bracts. Flowers 5-merous, calyx and hypanthium 4–5.5 mm long, with a few scattered stiff hairs, calyx 2–3 mm long, minutely denticulate, corolla tube 2 mm, out-

side glabrous, inside in throat with red-brown hairs, lobes 5 mm, outside finely pubescent, anthers ovoid-ellipsoid, 3.3–4 mm long, filaments 1–1.3 mm, glabrous. Style 4 mm long, stigma 3–4 mm long, thick, clavate, ridged. Fruits ovoid to globose, 3–5 mm diam., with prominent disc remnants and calyx scar.

Distribution — New Guinea.

Representative materials: New Guinea: BW 6776; Ledermann 7625; NGF 31784, 42637, 46805, 48450; Soegeng & Reksodihardjo 427.

23. *Aidia solomonensis* Ridsdale, *spec. nov.*

Scandens usque ad 30 m altae. Stipulae triangulares usque ad 5 mm longae. Folia elliptica 10–13 cm longae et 3–5 cm lata, supra glabra, infra ad nervos pubescentia, apice acuta, basi obtusa interdum inaequilatera, nervis lateralibus 6–9 paribus, petiolo usque ad 8 mm longo. Inflorescentia usque ad 5 cm longae, ab nodo aphylllo, internodis floriferis contractis. Flores 5-meri. Calyx et hypanthia 4 mm longa, sparse pubescentia. Calyx 2–3 mm longa, minute denticulata. Corolla aliquantum campanulata, tubo 4 mm longo, extus parte superiore russo-hirsuto, interiore in parte superiori furgineo-tomentoso, lobis 4–5 mm longis reflexis. Stigma 4 mm longa, stylus 4 mm longus, stigma lata clavata, 2 mm longa, longitudinaliter costulatis, demum bifida. Antherae ellipoidea, 2.5 mm longae, apiculatae. Fructus c. 5 mm diametro. — Typus: BSIP (Whitmore) 1422 (L holo), Solomon Islands.

Large woody liane attaining 30 m, stem up to 6 cm, ultimate branches russet hairy. Stipules triangular, up to 5 mm long. Leaves elliptic, 10–13 by 3–5 cm, those above the inflorescence bearing node often smaller, 6–10 by 2–3 cm, above glabrous, below with a few scattered hairs particularly on the nerves, apex acute, base obtuse, sometimes unequal, lateral nerves 6–9 pairs. Petiole up to 8 mm, usually hairy. Inflorescence, usually from a leafless node separated from the leaf-bearing node by a short internode 4–8 mm long, with 3 main branches up to 5 cm long, the nodes of the inflorescence short. Flowers 5-merous. Calyx and hypanthium 4 mm long with a few scattered hairs, calyx tube 2–3 mm long with minute toothed lobes. Corolla somewhat campanulate, tube 4 mm long, outside with russet hairs in the upper 1/3, inside with dense red-brown hairs in the upper 2/3, lobes 4–5 by 1–1.5 mm, reflexed, outside glabrous, anthers ellipsoid, 2.5 mm long, apiculate, filaments 1 mm. Style 4 mm, stigma thickly clavate, 2 mm, ridged, ultimately becoming cleft to the base. Fruits globose, c. 5 mm diam.

Distribution — Solomon Islands (Kolombangara, Santa Isabel, Rendoza).

Representative materials: Solomon Islands: BSIP 1422, 1906, 7502, 8316, 8770.

24. *Aidia zippeliana* (Scheff.) Ridsdale, *comb. nov.*

Gynopachis zippeliana Scheff. in Treub, Ann. Jard. Bot. Buitenzorg 1 (1876) 28; Tirveng. & Sastre, Bull. Mus. Natl. Hist. Nat., B, Adansonia, 4e sér., 8 (1986) 285. — *Randia zippeliana* (Scheff.) F. Muell., Descr. Notes Papuan Pl. 1 (1876) 25, Boerl., Fl. Ned. Ind. 2 (1891) 130, Valeton, Nova Guinea 8 (1911) 468. — Type: Teijsmann (7856), 25-9-1871 (BO holo; fragm. L), Andai. *Randia zippeliana* var. *oblanceolata* Valeton, Nova Guinea 8 (1911) 469. — Lectotype: Versteeg 1812 (L), New Guinea.

Scrambling liane with horizontal branches. Stipules triangular, 4–8 mm long. Leaves elliptic, (6–)10–20(–25) by (1.5–)4–8(–9) cm, above and below glabrous, apex

acute to acuminate, base acute to obtuse, lateral nerves 6–12 pairs. Petiole up to 0.5 cm. Inflorescence usually from a leafless node separated from the leaf bearing nodes by a short internode up to 7 cm long, usually with 3 main axes, branches glabrous, nodes with triangular bracts. Flowers 5-merous, calyx and hypanthium 3 mm, glabrous, calyx 1–1.5 mm, minutely denticulate, margins ciliate. Corolla tube 2–3 mm (up to 3.75 mm, vide Valeton) long, outside glabrous, inside with a dense ring of hairs in the upper 2/3, lobes 2.5–3 mm long, reflexed, glabrous, anthers ovoid, 1.7–2 mm long, filaments short, 0.2 mm. Style 3–4 mm long, stigma clavate 1–1.5 mm long, ridged. Fruits ovoid to globose, 0.4–0.6 mm diam., calyx scar and disc remnants prominent.

Distribution — New Guinea.

Representative materials: New Guinea: BW 522, 5989; Lam 704; Ledermann 6848, (7153 drawing); NGF 10316, 40567; Schodde 3032.

Section *Xylanthorandia* (Baill.) Ridsdale, *comb. nov.*

Genipa sect. *Xylanthorandia* Baill., Hist. Pl. 7 (1880) 310. — Type species: *Randia beccariana* Baill.

25. *Aidia beccariana* (Baill.) Ridsdale, *comb. nov.*

Randia beccariana Baill., Adansonia 12 (1879) 246. — *Gynopachis beccariana* (Baill.) Tirveng. in Tirveng. & Sastre, Bull. Mus. Natl. Hist. Nat., B, Adansonia, 4e sér., 8 (1986) 284. — Lectotype (Tirvengadum & Sastre, 1986): Beccari 3594 (K iso), Borneo, Sarawak.

Large liane, branches with thin pallid bark. Leaves elliptic, 17–30 by 6–10 cm, coriaceous, above and below glabrous, apex acute, base somewhat attenuate and subauriculate, lateral nerves 12–14. Petiole 0–3 mm. Inflorescence glomerate, woody, totally compacted. Flowers 5-merous, pedicel up to 15 mm. Calyx and hypanthium 6–8 mm long, glabrous, calyx 4–5 mm, slightly undulate, margins ciliate. Corolla infundibular, said to be white, tube 5–9 mm long, outside glabrous, inside with a ring of hairs in the lower 1/3, lobes 12–18 by 7–8 mm, erect, apex obtuse, anthers linear, 7 mm long, erect, filaments c. 1 mm. Style c. 20 mm, not significantly exserted, stigma linear-clavate, 10 mm long. Fruits globose, c. 10 mm diam.

Distribution — Borneo (Sarawak, Kalimantan).

Note — Appears to differ from *A. jambosoides* by the relatively short corolla tube relative to the lobes, which are 1.5–2 times as long as the tube.

Representative materials: Borneo: Sarawak, Anderson 13369; Kalimantan, PBU (Ridsdale) 190.

26. *Aidia jambosoides* (Valeton) Ridsdale, *comb. nov.*

Randia jambosoides Valeton, Icon. Bog. 4 (1914) 135, tab. 342. — *Gynopachis jambosoides* (Valeton) Tirveng. in Tirveng. & Sastre, Bull. Mus. Natl. Hist. Nat., B, Adansonia, 4e sér., 8 (1986) 284. — Lectotype (Tirvengadum & Sastre, 1986): Beccari 778 (K iso), Borneo, Sarawak.

Large liane, young branchlets with pallid bark. Stipules shortly triangular, 4 mm, glabrous. Leaves elliptic, 15–30(–35) by 5–10 cm, coriaceous, above and below glabrous, apex acute to acuminate, base obtuse, lateral nerves (8–)12–15 pairs. Peti-

ole 0–8 mm. Inflorescence fasciculate, woody, totally compacted, ramiflorous or from a leafless node, separated from the leaf bearing node by an internode up to 2.5 cm long. Flowers 5-merous, pedicel up to 15 mm. Calyx and hypanthium 6–8 mm, glabrous, calyx 3 mm, minutely denticulate. Corolla infundibular, said to be white, tube 10 mm long, broadening at the top, outside glabrous, inside with a ring of hairs in the basal 1/3, lobes 8–10 by 3–4 mm, erect, glabrous, apex obtuse, anthers linear, 7 mm, erect, filaments c. 1 mm. Style 18–20 mm, stigma clavate, 6 mm, barely exserted, slightly bilobed at the apex. Fruits ovoid to globose, up to 10 mm diam.

Distribution — ?Sumatra, Borneo (Brunei, Sarawak, Sabah, Kalimantan).

Note — This species seems to be the most widespread of the closely related species of sect. *Xylanthorandia*. The fruiting specimen from Sumatra (*Buwalda* 6847) is tentatively placed here. Apparently the species can be separated from the rarer *A. beccariana* by the infundibular corolla tube and the relatively shorter corolla lobes, which are approximately equal in length to the tube.

Representative materials: Borneo: BRUN 5208, 5228; Dransfield JD 7312; Haviland 663; Kostermans 10418, 13968; S(arawak) 17525, 19887, 24842, 36646, 38747, 38931.

27. *Aidia longiflora* Ridsdale, spec. nov.

Scandens usque ad 12 m. Stipulae triangularae 3 mm longae. Folia elliptica 15–22 cm longa et 6–8 cm lata, coriacea, utrinque glabra, apice acuta, basi attenuata interdum inaequalia, sub-auriculata, nervis lateralibus 11–14 paribus, petiolo 0–3 mm longo. Inflorescentia fasciculata, ramiflora vel ab nodo aphylo. Flores 5-meri. Calyx et hypanthia 6 mm longa. Calyx c. 3 mm longa, glabra, margine undulato, leviter ciliato. Corolla infundibularis, tubo 18–24 mm longo, extus glabro, intus ad basim annulo tomentoso, lobis 6–7 mm longis, erectis, glabris. Antherae 6 mm longae, lineares, appartere erectae. Stylus c. 30 mm longus, stigma clavata, 6 mm longa. Fructus ignotus. — Typus: S (P. Chai) 36029 (L holo), Borneo, Sarawak.

Large liane to 12 m, branchlets light brown, slightly scurfy. Stipules shortly triangular, 3 mm. Leaves elliptic, 15–22 by 6–8 cm, coriaceous, above and below glabrous, apex acute, base attenuate, somewhat unequal, sub-auriculate, lateral nerves 11–14 pairs. Petiole 0–3 mm. Inflorescence fasciculate, woody, totally compacted, ramiflorous or from a leafless node separated from the leaf bearing node by an internode of c. 3 cm. Flowers 5-merous, calyx and hypanthium 6 mm long, calyx c. 3 mm, glabrous, margins undulate, slightly ciliate. Corolla infundibular, said to be pink, tube 18–24 mm, outside glabrous, inside with a ring of hairs in the narrow basal part, lobes 6–7 by 4 mm, erect, glabrous, apex obtuse to slightly apiculate, anthers linear, 6 mm long, apparently erect, filaments c. 1 mm. Style c. 30 mm, not significantly exserted, stigma clavate, 6 mm. Fruit not seen.

Distribution — Borneo (Sarawak).

Representative material: Borneo: S(arawak) 36237.

28. *Aidia acutipetala* Ridsdale, spec. nov.

Scandens. Stipulae breves triangularae usque ad 3 mm longa, glabrae. Folia late elliptica (15–)20–35 cm longa et 7–15 cm lata, coriacea, utrinque glabra, apice acuta vel acuminate, basi obtusa vel subcordata, nervis lateralibus 15–20 paribus, petiolo usque ad 1 cm longo.

Inflorescentia fasciculata, ramiflora vel ab nodo aphylla. Flores 5-meri, pedicello usque ad 1 cm longo. Calyx et hypanthia 10–12 mm longa, glabra. Calyx 7–8 mm longa, margine minute denticulato. Corolla infundibularis, tubo 7 mm longo extus glabro intus ad basim leniter tomentoso, lobis 12–13 mm longis, erectis, glabris. Antherae 8 mm longae, lineares, erectae, porcatae. Stylus 14 mm longus, stigma 6 mm longa, clavata, biloba. Fructus ovoidus vel globosus, c. 10 mm diam. — Typus: *S (Ilias & Yeo) 38443* (L holo), Borneo, Sarawak.

Large liane, branchlets with pallid bark. Stipules shortly triangular, up to 3 mm long, glabrous. Leaves broadly elliptic, (15–)20–35 by 7–15 cm, coriaceous, above and below glabrous, apex acute to acuminate, base obtuse to subcordate, sometimes decurrent along petiole, lateral nerves 15–20 pairs. Petiole up to 1 cm. Inflorescence woody, fasciculate, compacted, branches up to 1.5 cm, ramiflorous or borne on a leafless node separated from the leaf bearing node by an internode up to 2 cm. Flowers 5-merous, pedicel up to 1 cm. Calyx and hypanthium 10–12 mm long, glabrous, calyx 7–8 mm, margins minutely denticulate. Corolla infundibular, tube 7 mm, outside glabrous, inside with a weak ring of hairs in basal 1/3, lobes 12–13 by 3 mm, erect, glabrous, apex acute, anthers linear, 8 mm long, erect, ridged, filaments short 0.8 mm. Style 14 mm, stigma 6 mm, clavate bilobed at least at apex. Fruit ovoid to globose c. 10 mm diam., crowned by calyx remnants.

Distribution — Borneo (Sarawak, Sabah).

Ecology — Lowland forest.

Representative materials: Borneo: *S(arawak) 18332, 41240; SAN 30595.*

Section Anomanthodia

Aidia sect. *Anomanthodia* Benth. & Hook. f., Gen. Pl. 2 (1873) 87; Tirveng. in Tirveng. & Sastre, Bull. Mus. Natl. Hist. Nat., B, Adansonia, 4e sér., 8 (1986) 276. — *Genipa* sect. *Anomanthodia* (Hook. f.) Baill., Hist. Pl. 7 (1880) 309. — Type species: *Anomanthodia auriculata* (Wall.) Hook. f.

29. *Aidia auriculata* (Wall.) Ridsdale, comb. nov.

Webera auriculata Wall. in Roxb., Fl. Ind. ed. 1, 2 (1824) 537. — *Cupia auriculata* (Wall.) DC., Prodr. 4 (1830) 394. — *Randia auriculata* (Wall.) Steud., Nom. Bot. 2 (1841) 430. — *Pseudixora auriculata* (Wall.) Miq., Fl. Ind. Bat. 2 (1856) 210. — *Anomanthodia auriculata* (Wall.) Hook. f. in Benth. & Hook. f., Gen. Pl. 2 (1873) 87; Tirveng. & Sastre, Bull. Mus. Natl. Hist. Nat., B, Adansonia, 4e sér., 8 (1986) 277. — *Genipa auriculata* (Wall.) Baill., Hist. Pl. 7 (1880) 309. — Lectotype (Tirvengadum & Sastre, 1986): Wallich 8402 (Wall.-K), Malaysia, Penang.

KEY TO THE VARIETIES

- 1a. Leaf base (sub)auriculate. Stipules triangular, 4–5 mm long. Flowers 6- or 7-merous a. var. *auriculata*
- b. Leaf base acute. Stipules deltoid, 2–3 mm long. Flowers 5-merous b. var. *indigiriensis*



Fig. 3. *Aidia auriculata* (Wall.) Ridsdale var. *auriculata* (Ridsdale s.n., June 1989, Sabah).

a. var. *auriculata* — Fig. 3

Webera auriculata Wall. in Roxb., Fl. Ind. ed. 1, 2 (1824) 537. — *Cupia auriculata* (Wall.) DC., Prodr. 4 (1830) 394; G. Don, Gen. Syst. Bot. 3 (1834) 507. — *Randia auriculata* (Wall.) Steud., Nom. Bot. 2 (1841) 430; K. Schum. in Engl. & Prantl, Nat. Pflanzenfam. 4, 4 (1891) 75; King & Gamble, J. As. Soc. Beng. 72, ii (1903) 207; Merr., Philipp. J. Sc., Bot. 2 (1907) 427; Enum. Philipp. Flow. Pl. 3 (1923) 527; Ridley, Fl. Malay Penins. 2 (1923) 75; Craib, Fl. Siam. Enum. 2 (1923) 98; Backer & Bakhu. f., Fl. Java 2 (1965) 312, p.p.; Corner, Gard. Bull. Sing., Suppl. 1 (1978) 81, 150. — *Pseudixora auriculata* (Wall.) Miq., Fl. Ind. Bat. 2 (1856) 210. — *Anomanthodia auriculata* (Wall.) Hook. f. in Benth. & Hook. f., Gen. Pl. 2 (1873) 87; Fl. Brit. India 3 (1880) 108; Boerl., Handl. Fl. Ned. Indië 2 (1881) 18, 68, 130; Tirveng. & Sastre, Bull. Mus. Natl. Hist. Nat., B, Adansonia, 4e sér., 8 (1986) 277. — *Genipa auriculata* (Wall.) Baill., Hist. Pl. 7 (1880) 309. — Lectotype (Tirvengadum & Sastre, 1986): Wallich 8402 (Wall.-K.). *Aidia corymbosa* auct. non Blume: Wong, Malayan Nat. J. 38 (1984) 19, p.p.; Koord. & Valeton, Bijdr. Med. Lands Plant. 59 (1902) 88, p.p.

Large root climber attaining 30 m. Stipules triangular, 4–5 mm long, margins slightly ciliate. Leaves (broadly) elliptic, (8–)10–18(–22) by (3–)4–8(–13) cm, above and below glabrous, apex acute, base (sub-)auriculate, lateral nerves (5–)6–9(–11) pairs, tertiary nerves indistinct. Petiole 0–2 mm. Inflorescence from a leafless node, or leaves at this node highly reduced and bract-like, separated from the leaf bearing node by an internode up to 2.5 cm long, main axis (2–)3–6(–8) cm, glabrous to sparsely pubescent, lateral branches up to 7 cm long, usually densely pubescent. Flowers 6- or 7-merous. Calyx and hypanthium 2–3 mm, calyx cupular, 1 mm, outside glabrous or with a few scattered hairs, inside sparsely pubescent, margin slightly denticulate. Corolla tube (2–)3–4 mm, outside glabrous, inside densely hairy in the throat, hairs protruding from the throat, lobes (4–)5–7 mm long, reflexed, outside sometimes with scattered hairs at the base, anthers 3–4 mm long, recurved, transversely multilocellate, filaments short 1–2 mm. Style (4–)5–6 mm long, stigma (1.5–)2–3 mm long, bilobed, lobes recurved. Fruit 5–6 mm diam., ridged, said to be orange, crowned with disc remnants.

Distribution — Thailand, Malay Peninsular, Sumatra, Bangka, Borneo (Brunei, Kalimantan, Sabah, Sarawak), Philippines (to Mindanao).

Ecology — Primary, secondary and peatswamp forest.

Representative materials: Thailand: Kerr 15306. — Malay Peninsula: see Wong, 1984 sub *A. corymbosa*. — Sumatra: Jacobs 8151; de Wilde 15543. — Bangka: Kostermans & Anta 155. — Borneo: Alston 13112; Anderson 12410; Brooke 8854; Burley & Lee 281; Haviland 1976, 3424; Kostermans 4069; Kramadibrata 157; Meijer 2443; Mogea 4271; Ridsdale 2056; S(arawak) 25891, 27142; SAN 33748, 73344, 75313, 90369, 105311, 109481; Tahir 5216, 9203; Wong WKM 1744. — Philippines: Jacobs 7752; PNH 10224, 41916, 42156, 42254; Ridsdale 1254; Santos 4133; SMHI 960; Stern 2121; Wenzel 2551, 3017.

b. var. *indigiriensis* Ridsdale, var. nov.

Scandens. Stipulae deltoidae, 2–3 mm longae, margine ciliato. Folia elliptica 4–9 cm longa et 2–5 cm lata, utrinque glabra, apice acuta, basi acuta, nervis lateralibus 5–6 paribus, petiolo 5 mm longo. Flores 5-meri, immaturae. — Typus: Buwalda 6765 (L holo; K iso), Sumatra.

Liane. Stipules deltoid, 2–3 mm long, margins ciliate. Leaves elliptic, 4–9 by 2–5 cm, above and below glabrous, apex and base acute, lateral nerves 5 or 6 pairs, ter-

tiary nerves indistinct. Petiole 5 mm. Inflorescence from a leafless node separated from the leaf bearing node by an internode up to 3 cm long, basically dichasial, main axis 2–5 cm long, glabrous, lateral branches up to 3 cm, glabrous to sparsely pubescent. Flowers 5-merous, immature. Calyx and hypanthium 2–3 mm long, outside glabrous, calyx 1.5–2 mm, inside sparsely pubescent, lobes denticulate. Corolla tube of immature flowers short, inside with russet hairs in the throat, lobes 4 mm, inside and outside glabrous. Anthers 4 mm, transversely multilocellate, filaments short. Stigma of immature flowers 2.5 mm, clavate, ridged. Fruits unknown.

Distribution — Sumatra (Indigiri Highlands).

Ecology — Primary or marshy forest.

Note — Only two collections seen by my, *Buwalda* 6664, 6765. The two collections are clearly closely allied to var. *auriculata* but differ strikingly from all other material in the small stipules and leaves which are acute at the base. Further material is required to evaluate whether this is a distinct species or an extreme form of *A. auriculata*.

30. *Aidia corymbosa* (Blume) Wong

Gynopachis corymbosa Blume, Cat. Gew. Buitenzorg (1823) 48; Bijdr. Fl. Ned. Indië 2 (1826) 984; Miq., Fl. Ind. Bat. 2 (1856) 219; Ann. Mus. Bot. Lugd.-Bat. 4 (1869) 134. — *Randia corymbosa* Boerl., Handb. Fl. Ned. Indië 2, 1 (1891) 130, non W. & A. (1834); Koord., Fl. Tjibodas 3, 2 (1918) 17. — *Anomanthodia corymbosa* Tirveng., Nord. J. Bot. 3 (1983) 456; in Tirveng. & Sastre, Bull. Mus. Natl. Hist. Nat., B, Adansonia, 4e sér., 8 (1986) 277. — *Aidia corymbosa* Wong, Malayan Nat. J. 38 (1984) 19, p.p. — Lectotype (Tirvengadum & Sastre, 1986): Blume s.n. (L sh 908.224-226), Java.

Liane to 30 m tall, stem to 10 cm diam., young branches glabrous. Stipules deltoid, 3–6 mm long, keeled, margins ciliate. Leaves elliptic, 6–12(–15) by 3–6(–8) cm, coriaceous, above and below glabrous, apex acute, base subcordate to auriculate, lateral nerves 5–9 pairs. Petiole 0(–2) mm. Inflorescence from a leafless node, separated from the leaf bearing node by a short internode 1(–1.5) mm long, main axis of inflorescence 1(–1.5) cm long with 3 main branches up to 5 cm long, glabrous or sparsely pubescent, nodes bracteate. Flowers 5-merous. Calyx and hypanthium 3–4 mm long. Calyx cupular, 2 mm long, truncate, outside glabrous or with a few scattered hairs, inside glabrous; minutely denticulate, teeth pubescent. Corolla somewhat infundibular, tube 2 mm long, outside glabrous, inside with a ring of red-brown hairs in the throat; lobes 4–4.5 mm long, glabrous, anthers linear to ellipsoid, 4–4.5 mm long, becoming transversely multilocellate, filaments short, c. 1 mm. Style 2–3 mm, stigma 3 mm, linear-clavate, ridged. Fruits globose, c. 5 mm diam.

Distribution — Sumatra, Java, Borneo (*Korthals* s.n. without locality).

Notes — Koorders noted: "The young stem is attached to the substrate by clinging roots." He further suggested that there are differences in the colour of the leaves borne on the free shoots compared to those of the rooting shoots.

The species has been consistently confused with *A. auriculata*.

Representative materials: Blume s.n.; Junghuhn s.n.; Korthals s.n.; de Monchy 71; Reinwardt s.n.; Spanoghe s.n.; de Vriese s.n., 320; Winckler 29.

31. *Aidia dilleniacea* (Baill.) Ridsdale, comb. nov.

Randia dilleniacea Baill., Adansonia 12 (1879) 245. — *Anomanthodia dilleniacea* (Baill.) Tirveng. in Tirveng. & Sastre, Bull. Mus. Natl. Hist. Nat., B, Adansonia, 4e sér., 8 (1986) 277. — Type: Beccari 398 (BM iso), Borneo, Sarawak.

Large liane attaining 35 m. Young branchlets densely adpressed hairy. Stipules triangular, 9–12 mm, apex acicular for about 6 mm, outside densely adpressed hairy. Leaves obovate, 12–18(–22) by (4–)5–8(–11) cm, coriaceous, above glabrous, below with hairs, at least on the nerves, apex acute to apiculate, base attenuate, usually unequal and sub-auriculate, lateral nerves 10–12 pairs, marginal nerves pronounced. Petiole 0–3 mm. Inflorescence from a leafless node separated from the leaf bearing node by an internode up to 3 cm, main axis up to 3 cm, lateral axes up to 3 cm, densely pubescent. Flowers 5-merous. Calyx and hypanthium 6 mm long, calyx 3 mm, outside densely hairy, inside densely hairy in the upper 1/3. Corolla tube 4–5 mm, outside glabrous, inside densely hairy in the throat, hairs protruding, lobes elliptic, 4–5 mm long, outside sparsely to densely hairy, inside hairy at the base, reflexed, anthers linear, 3–4 mm long, transverse locellate anthers not observed, filaments short. Style 6–7 mm, stigma broadly bilobed, 2 mm. Fruit 6–8 mm diam., slightly pubescent, crowned with remnants of the disc.

Distribution — Sumatra, Borneo (Brunei, Kalimantan, Sarawak).

Ecology — Probably restricted to kerangas and peat swamp forest.

Representative materials: Sumatra: Buwalda 6628, 6408. — Borneo: Brooke 10894; Haviland & Hose 216, 3425e; S(arawak) 12405, 12969, 32800, 43029; Sinclair 10510; Tahir 9738; Teijsmann 8350.

32. *Aidia bakeri* (Merr.) Ridsdale, comb. nov.

Randia bakeri Merr., Philipp. J. Sc., Bot. 10 (1915) 109. — *Anomanthodia bakeri* (Merr.) Tirveng. in Tirveng. & Sastre, Bull. Mus. Natl. Hist. Nat., B, Adansonia, 4e sér., 8 (1986) 279. — Type: C. F. Baker 3253 (n.v., non POM), Philippines.

Randia alveolata Elmer, Leafl. Philipp. Bot. 9 (1934) 3266. — *Anomanthodia alveolata* (Elmer) Tirveng. in Tirveng. & Sastre, Bull. Mus. Natl. Hist. Nat., B, Adansonia, 4e sér., 8 (1986) 279. — Type: Elmer 16050 (distr. as *Randia faveodehiscens* Elmer) (A, L, US), Philippines.

Large liane 10–15 m high, stem 10–15 cm diam., young branches glabrous. Stipules deltoid, 3–4 mm long, apex somewhat acicular. Leaves elliptic, 8–12(–17) by 2–5(–8) cm, glabrous, apex acute, base obtuse, sometimes unequal, lateral nerves 8–12 pairs. Petiole up to 10 mm long. Inflorescence from a leafless node, separated from the leaf bearing node by a short internode up to 1.5 cm long, main axis highly compacted, up to 0.5 cm long, main branches up to 1 cm long, glabrous, nodes bracteate. Flowers 5-merous. Calyx and hypanthium 4 mm long, calyx cupulate, 1.5–2 mm long, outside glabrous or with a few scattered hairs, inside glabrous, truncate, minutely denticulate. Corolla somewhat infundibular, tube 4(–6) mm, outside glabrous, inside with a ring of hairs in the upper 2/3, hairs rufous; lobes 4–7 mm long, glabrous, anthers elongate-linear, 4–5 mm long, becoming transversely multilocellate, filaments 2 mm. Style 7 mm long, stigma linear-clavate, 4–5 mm, ridged, cleft for c. 1.2 mm. Fruits globose, 4–5 mm diam., calyx deciduous.

Distribution — Philippines.

Note — Fruiting material is sometimes difficult to separate from *A. acuminata*.

Representative materials: Philippines: BS 41598; Elmer 16050; FB 28626.

33. *Aidia lancifolia* Wong

Aidia lancifolia Wong, Malayan Nat. J. 38 (1984) 20. — *Anomanthodia lancifolia* (Wong) Tirveng. in Tirveng. & Sastré, Bull. Mus. Natl. Hist. Nat., B, Adansonia, 4e sér., 8 (1986) 279. — Type: SFN (*Holttum*) 9348 (SING holo, n.v.), Malaysia, Johore.

Woody climber to 30 m. Ultimate branches glabrous. Stipules broadly triangular, 5–6 by 3–4 mm. Leaves narrowly elliptic to lanceolate, (5–)9–17 by (1–)2.5–5 cm, above and below glabrous except for domatia, apex acute to acuminate, base obtuse, usually unequal, lateral nerves (6–)10–14 pairs, indistinct due to dark reddish brown drying colour, axils with domatia. Petiole 0.5(–1) mm. Inflorescence from a leafless node, separated from the leaf bearing node by a short internode up to 0.5 cm, up to 6 cm long, main axis 2–4(–5) cm long, glabrous, bracts triangular, ultimate branches glabrous to slightly pubescent. Flowers 6–9-merous. Calyx and hypanthium 3.5–6 mm, glabrous, calyx tubular, 2–4.5 mm, minutely denticulate. Corolla tube 2.5–4 mm, outside glabrous, inside with hairs in upper 1/3, not conspicuously protruding from the throat, corolla lobes 5.5–9 by 1.5–2 mm, reflexed, anthers 6–7 mm long, transversely multilocellate, filaments 1–1.2 mm. Style 6 mm, stigma 3–4 mm, clavate, grooved or notched at the apex. Fruits globose 4–6 mm diam., longitudinally ridged, capped by calyx scar.

Distribution — Malay Peninsula, Sumatra, Borneo (Sabah, Sarawak, Kalimantan).

Representative materials: Argent et al. 93158; Kostermans 10395; Meijer 4341; SAN 17510, 31806, 87366; S(arawak) 24721, 27212, 28188, 28348, 36255, 41439, 41654.

34. *Aidia foveata* Ridsdale, spec. nov.

Scandens. Stipulae triangularae, 3–4 mm longae. Folia elliptica (12–)15–25 cm longa et (5–)6–10 cm lata, coriacea, utrinque glabra, apice acuta, basi obtusa, nervis lateribus 10–12 paribus, petiolo usque ad 1 cm longo. Inflorescentia ab nodo aphyillo. Flores 5-meri. Calyx et hypanthia 3 mm longa, glabra. Calyx campanulata, 2 mm longa, margine undulato, ciliato. Corolla rotata, tubo 4–5 mm longo, extus glabro intus ad parte superiore tomentoso, lobis 5–6 mm longis, reflexis, apice abrupte acutis. Antherae 3–4 mm longae, reflexae, foveolatae vel aureolatae. Stylus 6 mm longus, stigma clavata, 3 mm longa, biloba. Fructus globosus (4–)6–8 mm diam. — Typus: SAN (*A. Gambatting*) 95113 (L holo), Borneo, Sabah.

Liane. Stipules triangular, 3–4 mm long. Leaves elliptic, (12–)15–25 by (5–)6–10 cm, coriaceous, above and below glabrous, apex acute, base obtuse, lateral nerves 10–12 pairs. Petiole up to 1 cm. Inflorescence from a leafless node separated from the leaf bearing node by a short internode 0.5–0.8(–1.2) cm long, basically dichasial, usually with 3 or 4 main branches up to 4 cm long. Flowers 6-merous, calyx and hypanthium 3 mm, glabrous, calyx 2 mm, campanulate, margin undulate, ciliate. Corolla rotate, tube 4–5 mm, outside glabrous, inside densely hairy in the upper

2/3, hairs pallid in colour, lobes 5–6 mm long, reflexed, apex abruptly acute, outside glabrous, inside with a faint pubescence on the mid line, anthers 3–4 mm long, reflexed, transversely locellate, filaments short, 1 mm. Style 6 mm, stigma clavate, 3 mm, bilobed to the base. Fruit globose, (4–)6–8 mm diam.

Distribution — Borneo (Kalimantan, Sabah, Sarawak); Philippines (Mindanao).

Ecology — Primary and disturbed lowland rain forest

Note — The Philippine record is based on *R.S. Williams 2161*, cited by Elmer as representing *Randia williamsii* Elmer. The type of *R. williamsii*, *Elmer 1274*, is a different species, the specimen being the terminal part of a plagiotropic shoot of *Randia (Oxyceros) uncaria* Elmer.

Representative materials: Borneo: *Amdjah* 990; *Kostermans* 4999, 13729; *SAN* 43547, 88869, 90329, 107667; *S(arawak)* 28893, 43547. — Philippines: *Williams* 2161.

Section Gynopachis (Blume) Wong

Gynopachis Blume, Cat. Gew. Buitenzorg (1823) 26; Tirvengadum & Sastre, Bull. Mus. Natl. Hist. Nat., B, Adansonia, 4e sér., 8 (1986) 281. — *Randia* sect. *Gynopachis* (Blume) Hook. f. in Benth. & Hook. f., Gen. Pl. 2 (1873) 88, p.p. — *Randia* subg. *Gynopachis* (Blume) Valeton, Icon. Bog. 3 (1909) 115. — Type species: *Gynopachis acuminata* Blume.

Randia sect. *Parviflorae* Ridley, Fl. Malay Penins. 2 (1923) 71. — Lectotype (Tirvengadum & Sastre, 1986): *Randia binata* King & Gamble.

35. *Aidia acuminata* (Blume) Wong

Gynopachis acuminata Blume, Cat. Gew. Buitenzorg (1823) 48; Bijdr. (1826) 984; Korth., Ned. Kruidk. Arch. 2 (1851) 182; Miq., Fl. Ind. Bat. 2 (1856) 219; Ann. Mus. Bot. Lugd.-Bat. 4 (1869) 134; Tirvengadum & Sastre, Bull. Mus. Natl. Hist. Nat., B, Adansonia, 4e sér., 8 (1986) 281. — *Randia acuminata* auct. non Benth.: Boerl., Handl. Fl. Ned. Indië 2 (1891) 130; Koord. & Valeton, Bijdr. 8 (1902) 88; Exkursfl. Java 3 (1912) 257. — *Randia wallichii* auct. non Hook. f.: Koord. & Valeton, Bijdr. 8 (1902) 88; Merr., Bibl. Enum. Born. Pl. (1921) 562. — *Randia boerlagei* Koord. & Valeton, Bijdr. 8 (1902) 269; Valeton, Icon. Bogor. 3 (1909) 115, tab. 247; Backer & Bakh. f., Fl. Java 2 (1965) 312. — *Aidia acuminata* (Blume) Wong, Malayan Nat. J. 38 (1984) 54. — Lectotype (Tirvengadum & Sastre, 1986): *Blume s.n.* (L holo: none of the six sheets designated as lectotype; standard sheets: 908.223-867/851/847; large sheets 909.286-1/2/3), Java.

Griffithia acuminata Korth., Ned. Kruidk. Arch. 2 (1851) 171; Walp., Ann. 2 (1851) 794. — *Randia korthalsii* Merr., Bibl. Enum. Born. Pl. (1921) 562, nom. nov. — Type: *Korthals s.n.* (L holo, sh. 908.223-888), Borneo, Kalimantan.

Gynopachis acuminata var. *nitida* Miq., Fl. Ind. Bat. 2 (1856) 220. — Type: *Junghuhn s.n.* (L holo, sh. 908.223.887), Sumatra, Upper Angkola.

Randia binata King & Gamble, J. As. Soc. Beng. 72 (1903) 205; Ridley, Fl. Malay Penins. 2 (1923) 76; Corner, Gard. Bull. Sing., Suppl. 1 (1978) 150. — *Aidia binata* (King & Gamble) Wong, Malayan Nat. J. 38 (1984) 38, p.p. — *Gynopachis binata* (King & Gamble) Tirveng. in Tirveng. & Sastre, Bull. Mus. Natl. Hist. Nat., B, Adansonia, 4e sér., 8 (1986) 283. — Lectotype (Wong, 1984): *Wray 2134* (n.v.), Malaysia, Perak.

Randia umbellata Elmer, Leafl. Philipp. Bot. 1 (1906) 31; Merr., Enim. Philip. Flow. Pl. 3 (1923) 528. — *Gynopachis umbellata* (Elmer) Tirveng. in Tirveng. & Sastre, Bull. Mus. Natl. Hist. Nat., B, Adansonia, 4e sér., 8 (1986) 283. — Type: *Copeland 1302* (US), Philippines, Mindanao.

Large root climber attaining 20 m. Stipules triangular, 3–5 mm. Leaves elliptic, 10–30 by 4–12 cm, coriaceous, above and below glabrous, apex acute to acuminate, base obtuse to sub-auriculate, lateral nerves 8–15 pairs. Petiole 0–10 mm. Inflorescence from a leafless node separated from the leaf bearing node by an internode up to 3 cm long, highly compacted, fasciculate, short branches with numerous bracts. Flowers 5-merous. Calyx and hypanthium 2–4 mm long, calyx cupular 1–2 mm, margins slightly undulate to denticulate, corolla tube 3–4.5 mm long, outside glabrous, inside densely pallidly hairy in the upper 1/3, lobes elliptic 3–7 mm long, 1–2 mm broad, reflexed, anthers linear, 3–4 mm long, filaments 0.5–1 mm. Style 4–6 mm, stigma clavate, apparently bilobed, 1.5–3.5 mm, grooved. Fruit globose, 4–7 mm diam.

Distribution — Malay Peninsula, Sumatra, Java, Borneo (Sarawak, Sabah, Kalimantan), Moluccas (Ceram), Celebes, Philippines (Luzon, Mindoro, Catacanes, Leyte, Panay, Sibuyan, Samar, Bohol, Mindanao).

Note — The distribution is somewhat unusual suggesting the existence of two taxa. The older classical collections from Java tend to have smaller flowers, as illustrated in *Icon. Bog.* 3, tab. 247, with relatively short corolla tubes, 3 mm, and corolla lobes 3–4 mm long. The more recent collections from the Philippines have corolla tubes 4–4.5 mm long and lobes 5–7 mm long. Within Java there is one collection, *Bakhuisen van den Brink f.* 3346, with flowers identical to those in the Philippines.

Representative materials: Malay Peninsula, see Wong, 1984. — Sumatra: *Bunnemeijer* 458; *Junghuhn s.n.*; *Korthals s.n.* — Java: *Blume*, *De Vriese*, *Zippel*, *Junghuhn*, all *s.n.*; *Bakhuisen van den Brink f.* 3346. — Borneo: Sarawak, *Chew Wee-Lek* 628; Sabah, *SAN A* 4735; Kalimantan, *Kostermans* 21381. — Celebes: *van Balgooy* 3923; *Elbert* 2580; *Johansson*, *Nybom & Riebe* 75; *Koorders* 18586, 18587, 18667, 18708; *Lam* 2429; *Ramlanto & Fanani* 668. — Moluccas: *Rutten* 1589. — Philippines: *BS* 1320, 24488, 30334, 30885, 31102, 38988, 49514; *Cuming* 852; *Elmer* 10700, 11755, 12269, 14492, 15316; *FB* 12390; *ISU* 309; *PNH* 8032, 9948, 10287, 14516, 37177, 117040, 117419; *Ridsdale* 1155; *Wenzel* 498, 2721, 2869; *Whitford* 1405; *Zwickley* 524.

36. *Aidia impressinervis* (King & Gamble) Ridsdale, comb. nov.

Randia impressinervis King & Gamble, J. As. Soc. Beng. 72 (1903) 206; Merr., Bibl. Enum. Born. Pl. (1921) 562; Ridley, Fl. Malay. Penins. 2 (1923) 76. — *Aidia binata* Wong, Malay. Nat. J. 38 (1984) 18, f.1 D–G, p. p. (*Ridley* 14684). — *Gynopachis impressinervis* (King & Gamble) Tirveng. in Tirveng. & Sastre, Bull. Mus. Natl. Hist. Nat., B, Adansonia, 4e sér., 8 (1986) 283. — Lectotype (Tirvengadum & Sastre, 1986): *King's coll.* 10821 (K; L iso), Malaysia, Perak.

Straggling root climber to 15 m, ultimate branchlets slightly pubescent. Stipules triangular, 2–4 mm long, apex acuminate to acicular. Leaves elliptic, (5–)12–20 by (1–)3–5 cm, above glabrous, below glabrous to finely pubescent, apex acuminate, base rounded to acute, lateral nerves 7–12 pairs, often prominent below, axils sometimes with acrodromatia. Petiole up to 0.5 mm. Inflorescence from a leafless node, separated from the leaf bearing node by a short internode up to 2.5 cm long, highly compacted and fascicled, up to 1.5 cm long, main branches compacted, up to 0.7 cm long, with sparse stiff hairs, bracts triangular. Flowers 5-merous (6-merous vide King & Gamble). Calyx and hypanthium 3 mm, sparsely stiff hairy, calyx broadly campanulate, minutely denticulate. Corolla tube 2.5–3 mm, outside glabrous, inside with pallid hairs in upper 1/3, usually not conspicuously protruding from the throat,

lobes 3 by 1.5 mm, outside glabrous, rarely with a few hairs, reflexed, anthers ovoid, 1–1.2 mm long, filaments short. Style 3 mm, hairy at the base, stigma clavate-globose, 1 mm. Fruits ovoid to globose, 3–5 mm diam., crowned by calyx and disc scar.

Distribution — Malay Peninsula, Sumatra, Borneo (Kalimantan, Sabah, Sarawak).

Representative materials: Malay Peninsula: King's coll. 3336, 4894, 10399; Ridley 14648; Scortechini 232; SFN 32459; Wray 2158. — Sumatra: de Wilde 20491. — Borneo: Brooke 9308; Haviland 2969; Hose 40, 415; Kostermans 4483, 9728, 9833; S(arawak) 18917; SAN 17395.

37. *Aidia halleri* Ridsdale, *spec. nov.*

Scandens usque ad 25 m. Stipulae anguste triangulares, 2–3 mm longae. Folia elliptica 8–12 longa et 2.5–4.5 cm lata, coriacea, apice acuta vel acuminata, basi acuta, nervis lateribus 7–9 paribus, petiolo usque ad 6 mm. Inflorescentia ab nodo aphylio. Flores 5-meri. Calyx et hypanthia 4 mm, extus pubescens, calyx campanulata, margine undulato. Corolla tubo 3 mm, extus glabro, intus as parte superiore tomentoso, lobis 3 mm longis, reflexis, extus tomentosis. Antherae ovoidea, 1–1.2 mm longae, reflexae. Stylus 4 mm longus, stigma clavato-globosa. Fructus globosus 5 mm diam. — Typus: Hallier 2067 (L.).

Liane to 25 m. Stipules narrowly triangular, 2–3 mm long, hairy, apex somewhat glandular. Leaves elliptic, 8–12 by 2.5–4.5 cm, above and below glabrous, apex acute to acuminate, base acute, lateral nerves 7–9 pairs, axils sometimes with acrodomatia. Petiole up to 6 mm. Inflorescence from a leafless node separated from the leaf bearing node by a short internode up to 2.5 cm long, highly compacted and fascicled, up to 1 cm long, bracts numerous, triangular. Flowers 5-merous. Calyx and hypanthium 4 mm long, outside with a few scattered hairs, calyx broadly campanulate, minutely denticulate. Corolla tube 3 mm, outside glabrous, inside with hairs in the upper 1/3, lobes 3 by 1.5 mm, outside densely tomentose, reflexed, anthers ovoidal 1–1.2 mm long, filaments short. Style 4 mm, stigma clavate-globose. Fruits ovoid, 5 mm diam.

Distribution — Borneo (Sarawak).

Representative materials: Borneo: Haviland 895; Jacobs 5006; S(arawak) 16593, 28036.

38. *Aidia tomentosa* (Blume) Ridsdale, *comb. nov.*

KEY TO THE VARIETIES

- 1a. Young leaf lamina tomentose, glabrescent. Java a. var. *tomentosa*
- b. Young leaf lamina glabrous, nerves with hairs. Lesser Sunda Islands, Celebes b. var. *sundaica*

a. var. *tomentosa*

Gynopachis tomentosa Blume, Bijdr. (1826) 984; Miq., Fl. Ind. Bat. 2 (1857) 220; Ann. Mus. Lugd.-Bat. 4 (1869) 134, 261. — *Randia gynopachis* Boerl., Handb. Fl. Ned. Indië 2 (1891) 130; Backer & Bakh. f., Fl. Java 2 (1965) 312. — Type: Blume s.n. (L holo, standard sheets 908.220-785/795, large sheet 909.215-187), Java, Boerangrang.

Large hemi-epiphyte or liane, young branches usually brown hairy. Stipules broadly triangular, up to 8 mm long. Leaves elliptic to elliptic oblong, (12–)15–23 by (4–)4.5–6(–9) cm, coriaceous; apex acute, base obtuse to subcordate; lateral nerves 10–14 pairs, below with scattered hairs and usually with tomentose pubescence on adjacent lamina. Petiole 0(–2) mm. Inflorescence from a leafless node separated from the leaf bearing nodes by a short internode up to 2(–3) cm long, main branches up to 5 cm long, sparsely hairy, nodes bracteate. Flowers immature. Fruits 10–15(–20, vide Valeton) mm diam.

Distribution — Java.

Notes — The species has never been recollected recently. The Javanese material has a striking tomentose pubescence of the younger leaves, traces of which are to be found on the majority of the older leaves. This has not been observed in specimens from other areas. I have formally retained these collections as a separate variety.

Mature flowers are said to never have been collected from Java (Backer & Bakh. f, 1965) and no mention or description of the flowers exists. Flowers are not present in the collections in Leiden or Bogor. Surprisingly, one specimen in Kew said to originate from Miquel, with on the herbarium sheet "Herbarium Hookerianum 1867", has a label of Blume mounted on the sheet. The specimen has two flowers, but young leaves are not tomentose below but sparsely pubescent. In Miquel's descriptions no reference is made to flowers. As materials from Blume were stored unmounted for many years there is some doubt that the label belongs to the specimen. A description of the flowers of this specimen follows:

Calyx and hypanthium 5–8 mm, calyx cupular, 3–4 mm long, sub-truncate, minutely denticulate. Corolla somewhat infundibular, tube 5–6 mm long, outside glabrous in the lower 2/3, above pubescent, inside glabrous, sometimes with a few hairs in the throat; lobes 8 mm long, outside densely pubescent. Style 11 mm, stigma 4 mm long, ridged.

b. var. *sundaica* Ridsdale, *var. nov.*

Scandens hemi-epiphyticus. Stipulae late triangulare usque ad 8 mm longae. Folia elliptica vel oblanceolata (8–)12–25 cm longa et (2–)4–6(–9) cm lata, coriacea, supra glabra, infra glabra vel pubescentia, non tomentosa, apice acuta, basi obtusa vel subcordata. Inflorescentia usque ad 2.5 cm longae. Flores 5-meri. Calyx et hypanthia 7–10 mm, calyx cupularis 5–7 mm longa. Corolla infundibularis, tubo 5–7 mm longo, extus ad parte inferiore glabro, supra pubescentio, intus glabrus, lobis 15–18 mm longis, reflexis. Antherae 8–10 mm longae. Stylus 12–15 mm longus. Fructus globosus 9–12 mm diametro. — Typus: *Verheijen* 2520 (L), Lesser Sunda Islands, Flores.

Large hemi-epiphytes or lianes. Young branches glabrous or sparsely hairy. Stipules broadly triangular, up to 8 mm long. Leaves elliptic to oblanceolate, (8–)12–25 by (2–)4–6(–9) cm, coriaceous, apex acute, base obtuse to subcordate, lateral nerves 10–14 pairs, above glabrous, below glabrous or with a few scattered hairs, lamina not tomentose on young leaves, apex acute, base obtuse to subcordate, lateral nerves 10–14 pairs. Inflorescence from a leafless node separated from a leaf bearing node by a short internode up to 2.5 cm long, main branches up to 5 cm long, sparsely hairy, bracteate at the nodes. Flowers 5-merous. Calyx and hypanthium 7–10 mm, calyx cupular, 5–7 mm long, subtruncate, minutely denticulate. Corolla somewhat

infundibular, tube 5–7 mm long, outside glabrous in the lower 2/3, above pubescent, inside glabrous, sometimes with a few hairs in the throat; lobes 15–18 mm long, outside densely pubescent, anthers 8–10 mm long, linear, apiculate, filaments 3–4 mm long. Style 12–15 mm, stigma 8–10 mm long, ridged. Fruits globose, 9–12 mm diam., crowned by the discus remnants and calyx scar.

Distribution — Lesser Sunda Islands; Celebes.

Note — Schmutz 3650 notes “climbing epiphyte, closely attached by roots to the bark.” Van Balgooy 3217 includes the leading shoot indicating that it is a root-climber.

39. *Aidia bracteata* Ridsdale, spec. nov.

Scandens. Stipulae late triangularis usque ad 3 mm longae. Folia elliptica vel obovata 14–19(–22) cm longae et (4–)5–8(–10) cm lata, coriacea, utrinque glabra apice acuta, basi obtusa vel subcordata, nervis lateralibus 9–12 paribus, petiolo usque ad 3 cm longo. Inflorescentia usque ad 5 cm longae ab nodo aphyillo, internodis contractis bracteatis. Flores 5-meri, immaturi. Calyx et hypanthia 8–10 mm longa. Lobis corollas extus glabris. Fructus globosus 7–9 mm diametro. — Typus: *de Vogel* 5314 (L).

Climber. Stipules broadly triangular, up to 5 mm long. Leaves broadly elliptic to obovate, 14–19(–22) by (4–)5–8(–10) cm, coriaceous, above and below glabrous, apex acute, base obtuse to subcordate, lateral nerves 9–12 pairs. Inflorescence from a leafless node separated from a leaf bearing node by a short internode, up to 3 cm long, main branches up to 4 cm long, internodes somewhat compacted, bracteate at the nodes. Flowers 5-merous, immature. Calyx and hypanthium 8–10 mm long. Corolla lobes glabrous. Fruits globose, 7–9 mm diam.

Distribution — Celebes.

Note — In the young inflorescences the bracts are conspicuous between the compacted internodes. This little collected species seems to be very closely related to *A. tomentosa*, differing in the glabrous corolla lobes.

Representative materials: Celebes: *de Vogel* 2625; *Forman* 360.

40. *Aidia heterophylla* Ridsdale, spec. nov. — Fig. 4

Scandens hemi-epiphytiae ad nodos radicantes. Stipulae triangulares 3 mm longae. Folia ovata 2–6 cm longa et 1.5–3 cm lata, utrinque glabra, apice acuta, basi subcordata vel auriculata, subsessilis, nervis lateralibus 9–12 paribus. Inflorescentia usque ad 3 cm longae, ab nodo aphyillo, nodis floriferis bracteatis. Flores 5-meri. Calyx et hypanthia 7–8 mm longa. Calyx cupularis, 3–4 mm longa extus sparse hirsuta, marginibus truncatis minutis denticulatis. Tubo corollam 7 mm longa, extus glabro, interiore in parte dimidio distale tomentoso, lobis 15–18 mm longis, extus glabris, reflexis. Antherae 12–13 mm longae, apiculatae. Stylus 22–25 mm longus, stigma 10 mm longa, linear-clavata, longitudinaliter costulatis demum bifida. Fructus ignotus. — Typus: *van Balgooy* 3645 (L; BO iso), Celebes.

Hemi-epiphytic root climber. Stipules triangular, 3 mm long with acicular point. Orthotropic shoot with rootlets at the node, finely pubescent. Leaves ovate, 2–6 by 1.5–3 cm, above and below pubescent. Leaves of plagiotropic shoot elliptic-oblong, 20–27 by 7–10 cm, subsessile, above and below glabrous, apex acute, base subcordate to auriculate, lateral nerves 9–12 pairs. Inflorescence from a leafless node

separated from the leaf bearing node by a short internode, 0.5–1 cm long, with 2 or 3 main branches up to 3 cm long, bracteate at the nodes. Flowers 5-merous, calyx and hypanthium 7–8 mm long, calyx cupular, 3–4 mm long, outside sparsely hairy, margin truncate and minutely denticulate. Corolla tube 7 mm, outside glabrous, inside with russet hairs in the throat, lobes 15–18 mm long, reflexed, glabrous. Style

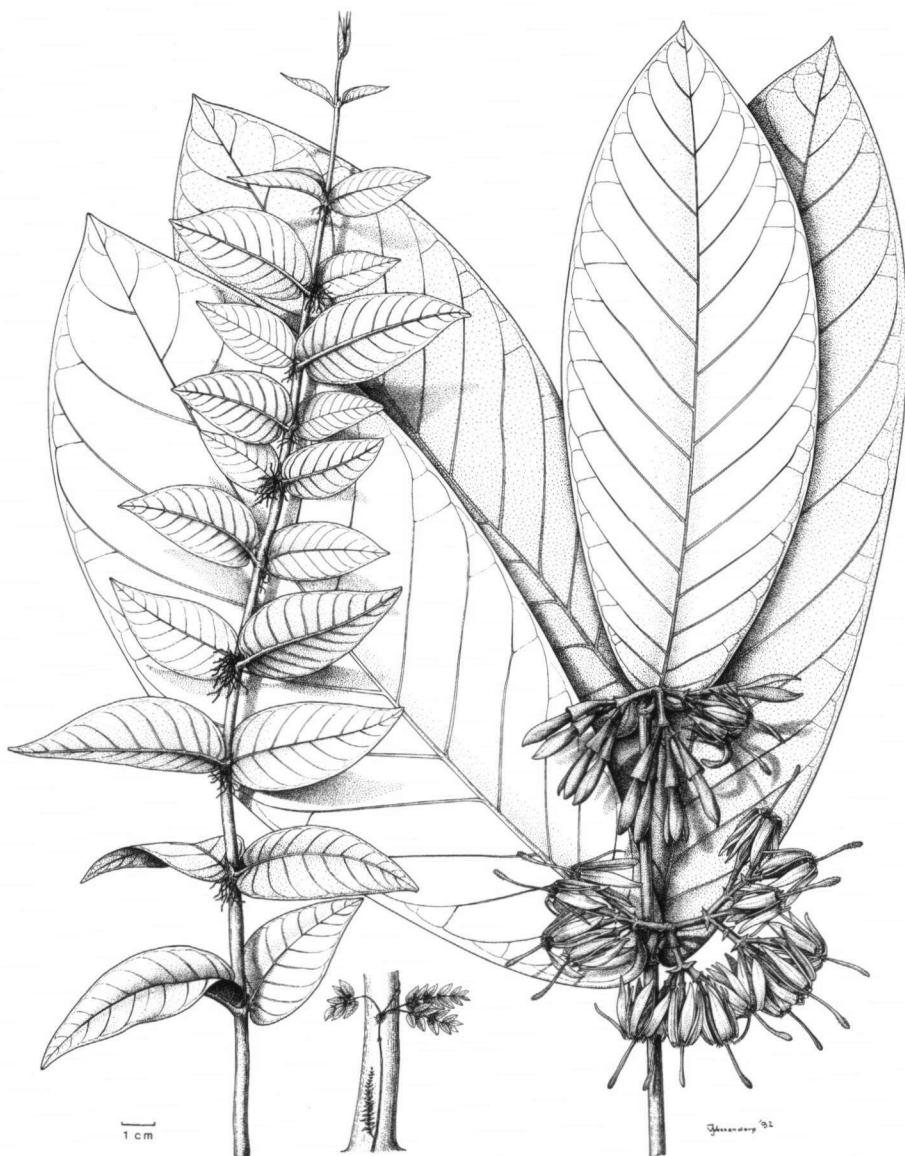


Fig. 4. *Aidia heterophylla* Ridsdale. Orthotropic rooting shoot, flowering shoot and field sketch of habit (van Balgooy 3645).

22–25 mm, stigma 10 mm, linear-clavate later becoming bifid, outside ridged, anthers 12–13 mm long, apiculate, filaments 3–5 mm long. Fruits unknown.

Distribution — Celebes, only known from the type.

41. *Aidia pulcherrima* (Merr.) Ridsdale, comb. nov.

Randia pulcherrima Merr., Philipp. J. Sc., Bot. 3 (1908) 164. — *Gynopachis pulcherrima* (Merr.) Tirveng. in Tirveng. & Sastre, Bull. Mus. Natl. Hist. Nat., B, Adansonia, 4e sér., 8 (1986) 285. — Lectotype (Tirvengadum & Sastre, 1986): *Clemens* 765 (n.v.); syntypes: *FB* (For. Bur. Philipp.) 7863 (US), *Elmer* 9127 (L, A), Philippines, Mindanao.

Randia pulchra Elmer ex Valeton, Bot. Jahrb. 60 (1926) 95, nom. nud.

Large hemi-epiphyte or liane, young branches sparsely hairy, rarely glabrous. Stipules broadly triangular, up to 6 mm long. Leaves elliptic, 15–20 by 5–8 cm, coriaceous, apex acute, base subcordate to auriculate, lateral nerves 8–10 pairs, below usually with a few scattered hairs, rarely glabrous. Inflorescence from a leafless node separated from the leaf bearing node by a short internode, 0.5–1.5 cm long, main branches up to 6 cm long, sparsely hairy to glabrous, nodes bracteate. Calyx and hypanthium 10–15 mm long, calyx cupular, 4 mm long, outside with a few scattered hairs, margins truncate and minutely denticulate. Corolla tube somewhat infundibular, c. 10 mm long, outside glabrous in lower 2/3, above pubescent, inside densely hairy with ferruginous hairs in the throat, hairs protruding, lobes 15–18 mm long, outside densely pallidly pubescent, anthers 10 mm long, apiculate, filaments short, 2 mm. Style 15–20 mm long, stigma clavate, c. 10 mm long, ridged. Fruits c. 14 by 10 mm, crowned by the disc remnants and calyx scar.

Distribution — Philippines.

Note — *PNH* 6392 differs from other specimens in the glabrous young leaves and other parts.

Representative materials: Philippines: *Elmer* 9127, 9497; *FB* 7836; *PNH* 6392, 10527, 19755, 117853.

42. *Aidia moluccana* Ridsdale, spec. nov.

Scandens hemi-epiphytaceae. Stipulae leviter cupulatae, 3–4 mm longae, apice aciculare. Folia elliptica 10–20 cm longae et 3–5 cm lata, coriaceae, utrinque glabra, apice acuta, basi subcordata vel auriculata, nervis lateralibus 8–10 paribus, subsessilis. Inflorescentia usque ad 3 cm longae, ab nodo aphylo, nodis floriferis bracteatis. Flores 5-meri. Calyx et hypanthia 7–8 mm longa. Calyx cupularis 2–3 mm longa, extus glabris vel sparse hirsutis, marginibus leviter denticulatis. Tubo corollam 2–4 mm longo, extus et intus glabro, lobis 15–17 mm longis, reflexis. Antherae 8–10 mm longae, apiculatae. Stylus 22–25 mm longus, stigma 8–10 mm longa, clavata longitudinaliter costulatis, demum bifida. Fructus ovoidus, 8–10 mm diametro. — Typus: *van Balgooy* 4938 (L; K iso), Moluccas, Buru.

Hemi-epiphytic climber. Stipules shallowly cupulate, somewhat ensheathing the stem, 3–4 mm long with an acicular point. Leaves elliptic, 10–20 by 3–5 cm, coriaceous, above and below glabrous, apex acute, base subcordate to auriculate, lateral nerves 8–10 pairs, subsessile. Inflorescence from a leafless node separated from a leaf bearing node by a short internode, 0.5–1 cm long, with 2 or 3 branches

up to 3 cm long, bracteate at the nodes. Flowers 5-merous, calyx and hypanthium 7–8 mm long, calyx cupular, 2–3 mm, outside glabrous to sparsely hairy, margin shallowly denticulate. Corolla tube short, 2–4 mm long, outside and inside glabrous, lobes 15–17 mm long, glabrous, reflexed, anthers 8–10 mm long, apex apiculate, filaments 3–4 mm. Style 22–25 mm, stigma 8–10 mm, clavate, later bifid, ridged. Fruit ovoid, 8–10 mm diam.

Distribution — Moluccas (Obi Is.; W Ceram; Sula Mangoli; NW Buru).

Representative materials: Moluccas: Bloembergen 4741; Kuswata & Soepadmo 139; de Vogel 4023.

43. *Aidia magnifolia* Ridsdale, *spec. nov.*

Scandens. Gemmae terminales vegetativae pubescentiae. Stipulae triangulares 6 mm longae. Folia elliptica 28–35 cm longa et 10–12 cm lata, supra glabra, infra leviter pubescentia, apice acuta, basicuneata et subcordata, nervis lateralibus 12–18 paribus, petiolo usque ad 5 mm longo. Inflorescentia usque ad 8 cm longae, ramis scorpioideis. Flores 5-meri, tantum cognitae immaturae. Calyx et hypanthia 3(–4) mm longa russo-ferruginea hirsuta. Calyx cupularis 2 mm longa, minute denticulata. Lobi corollam 4 mm longi, extus russo-hirsutae. Anthereae elongatae, 3 mm longae. Stigma 3 mm, porcata. Fructus ignotus. — Typus: Endert 3457 (L), Kalimantan, W Kutei.

Liane, young branchlets pubescent. Stipules triangular, 6 mm. Leaves elliptic, 28–35 by 10–12 cm, coriaceous, brittle when dry, above glabrous, below slightly pubescent, apex acute, base cuneate and subcordate, lateral nerves 12–18 pairs, hairy below. Petiole 0–5 mm. Inflorescence from a leafless node separated from the leaf bearing node by an internode c. 4 cm long, up to 8 cm long, basically cincinnoid. Flowers 5-merous, only known in the bud. Calyx and hypanthium 3(–4) mm, russet brown hairy, calyx cupular, 2 mm long, minutely denticulate. Corolla lobes 4 mm, outside russet hairy, anthers elongate, 3 mm long, filaments short. Stigma (immature) 3 mm, ridged. Fruit unknown.

Distribution — Borneo (Sabah, Kalimantan).

Representative material: Borneo: SAN 115884.

44. *Aidia paiei* Ridsdale, *spec. nov.*

Scandens usque ad 30 m. Stipulae triangulare 2–3 mm longae, glabrae, marginibus ciliatis. Folia elliptica 15–20(–25) cm longa et 5–8(–9) cm lata, coriacea, utrinque glabra, apice acuta, basi obtusa interdum inaequalia, nervis lateralibus 7–12 paribus, petiolo usque ad 1 cm longo. Inflorescentia fasciculata, ramiflora vel ab nodo aphylllo. Flores 5-meri, pedicello usque ad 15 mm longo. Calyx et hypanthia 6–7 mm longa, glabra. Calyx 3 mm longa, margine minute denticulato. Corolla rotata, tubo 4–5 mm longo, extus glabra, intus ad parte superiore tomentoso, lobis 8 mm longis, supra ad basim tomentosis. Antherae 5 mm longae, lineares, erectae. Stylus 4–5 mm longus, stigma clavata, biloba, 2–3 mm longa. Fructus ovoidus vel globosus. — Typus: S (I. Paie) 38508 (L holo).

Derivation of the name from the collector, Ilias Paie.

Large liane to 30 m, branches with light brown bark. Stipules triangular, 2–3 mm, glabrous, margins slightly ciliate. Leaves elliptic, 15–20(–25) by 5–8 (–9) cm, coriaceous, above and below glabrous, apex and base obtuse, slightly unequal, lateral

nerves 7–12 pairs. Petiole up to 1 cm long. Inflorescence woody, fasciculate, somewhat compacted with branches up to 1.5 cm, ramiflorous or from a leafless node separated from the leaf bearing node by an internode of 1–2 cm. Flowers 5-merous, pedicel up to 15 mm long. Calyx and hypanthium 6–7 mm, glabrous, calyx 3 mm, minutely denticulate. Corolla rotate, said to be white turning yellow, tube 4–5 mm, outside glabrous, inside densely hairy in the upper part, lobes 8 by 3–4 mm, reflexed at maturity, somewhat acuminate, outside slightly pubescent at the apex, inside densely pubescent at the base, anthers linear, 5 mm long, erect, ridged, filaments short, 0.8 mm. Style 4–5 mm, stigma 2–3 mm, clavate, becoming bilobed. Fruits ovoidal to globose, up to 10 mm diam., crowned by calyx remnants.

Distribution — Borneo (Kalimantan, Sabah, Sarawak).

Ecology — Hillside and disturbed lowland forest, also in kerangas forest and forest on sandstone.

Representative materials: Borneo: Beccari 284, 1084; Haviland 2155; Kostermans 6115, E Kutei; SAN 90388, 90392, 111655; S(arawak) 4677, 13680, 15562, 16972; P. Stevens 383.

45. *Aidia kinabaluensis* Ridsdale, *spec. nov.*

Scandens usque ad 20 m. Stipulae triangulares 4–5 mm longae, margine ciliato. Folia elliptica (12–)16–24 cm longa et (5–)6–9 cm lata, utrinque glabra, apice acuta, basi attenuata vel obtusa, inaequalia, sub-auriculata, nervis lateralibus 9–12 paribus, petiolo 0–5 mm longo. Inflorescentia cincinnata, ab nodo aphylo. Flores 5-meri, pedicello usque ad 3 mm longo. Calyx et hypanthia 3–4 mm longa. Calyx 2 mm longa, intus et extus minute pubescens, margine minute denticulata. Corolla rotata, tubo 3 mm longo, extus glabra intus ad parte superiore tomentoso, lobis 6 mm longo, reflexis. Antherae 4 mm longae. Stylus 4 mm longus, stigma clavata, 4 mm longa. Fructus ovoidus vel globosus, c. 5 mm diam
— Typus: SAN 28905 (L holo), Borneo, Sabah.

Large liane attaining 20 m. Stipules triangular, 4–5 mm long, margins ciliate. Leaves elliptic, (12–)16–24 by (5–)6–9 cm, above and below glabrous, apex acute, base attenuate to obtuse, unequal, sub-auriculate, lateral nerves 9–12 pairs. Petiole 0–5 mm. Inflorescence from a leafless node separated from the leaf bearing node by an internode 1–2 cm long, basically cincinnoid usually with 3 main branches up to 4(–7) cm long. Flowers 5-merous, pedicel 0–3 mm. Calyx and hypanthium 3–4 mm, calyx 2 mm, outside and inside finely pubescent, margins minutely denticulate. Corolla rotate, tube 3 mm, outside glabrous, inside with a dense ring of russet hairs in the upper 1/3, lobes 6 by 1.5 mm, glabrous, reflexed, anthers 4 mm long, elongate, filaments short, 1 mm. Style 4 mm, stigma elongate-clavate, 4 mm, becoming bilobed. Fruits ovoid to globose, c. 5 mm diam.

Distribution — Borneo (Sabah).

Ecology — Mid-montane forest, 1000–1700 m altitude.

Representative materials: Borneo: Clemens 29772, 50080; SAN A.4404, 28905, 46510, 49705.

46. *Aidia endertii* Ridsdale, *spec. nov.*

Scandens. Stipulae deltoidae, 2 mm longae, apice acutae. Folia elliptica 4–5 cm longa et 2–3 cm lata, utrinque glabra, apice acuta, basi acuta, nervis lateralibus 5–7 paribus, petiolo 5 mm longo. Inflorescentia ab nodo aphylo. Flores 5-meri, immaturi. Calyx et hypanthia

3 mm longa, extus sparse pubescentia. Calyx c. 2 mm longa, lobis denticulatis. Corolla immatura, tubo brevi, intus in ore hirsuto, lobis 3 mm longis. Antherae 3 mm longae. Stigma clavata, 2.5 mm longa, porcata. Fructus globosus, 2.5 mm diam. — Typus: *Endert 3565* (L holo, K iso), Kalimantan.

Derivation of the name from the collector F. H. Endert.

Liane, young branches glabrous. Stipules deltoid, 2 mm long, apex acute. Leaves elliptic, 4–5 by 2–3 cm, above and below glabrous, apex and base acute, lateral nerves 5–7 pairs, tertiary nerves indistinct. Petiole 5 mm. Inflorescence from a leafless node separated from the leaf bearing node by an internode up to 1.5 cm long, with 3 main branches up to 6 cm long. Flowers 5-merous, immature, calyx and hypanthium 3 mm, outside sparsely pubescent, calyx portion ill defined, c. 2 mm, lobes denticulate. Corolla only known in the bud, tube short, inside slightly hairy in the throat, lobes 3 mm, outside and inside glabrous. Anthers 3 mm long, filaments short. Stigma clavate, 2.5 mm, ridged. Fruit globose, 2.5 mm diam., crowned by remnants of the disc.

Distribution — Borneo (Central E Kalimantan).

Ecology — Limestone of Mt Kemoel.

Note — Only known from the type.

EXCLUDED SPECIES

from *Aidia*:

1. *Aidia canthioides* (Champ. ex Benth.) Masamune = *Fagerlindia canthioides* (Champ. ex Benth.) Tirveng. ex Ridsdale, *comb. nov.*

Randia canthioides Champ. ex Benth. in Hook. Kew J. 4 (1854) 194; Kaneh., Formos. Trees rev. ed. (1936) 680, f. 634; Li, Woody Fl. Taiwan (1963) 869; Anon., Icon. Corm. Sinic. 4 (1975) 235, t. 5884; Walker, Fl. Okinawa & S. Ryukyus (1976) 976, f.182. — *Aidia canthioides* (Champ. ex Benth.) Masam., Trans. Nat. Hist. Formosa 28 (1938) 118; Sci. Rep. Kanazawa Univ. 4 (1955) 84. — *Fagerlindia canthioides* (Champ. ex Benth.) Tirveng. in Tirveng. & Sastre, Bull. Mus. Natl. Hist. Nat., B, Adansonia, 4e sér., 8 (1986) 274, *comb. illeg.* (no basionym cited). — Type: *Champion s.n.* (K), Hong Kong.

Aidia canthioides var. *lanceolata* Masam., Trans. Nat. Hist. Formosa 29 (1939) 218; Sci. Rep. Kanazawa Univ. 4 (1955) 85. — Type: *Masamune s.n.* (n.v.), Taiwan.

2. *Aidia forbesii* (King & Gamble) Wong = *Aidiopsis orophila* (Miq.) Ridsdale, *comb. nov.*

Stylocorma orophila Miq., Ann. Mus. Bot. Lugd.-Bat. 4 (1869) 237. — *Webera orophila* (Miq.) Boerl., Handl. Fl. Ned. Indië (1891) 120. — *Randia orophila* Hallier, Rec. Trav. Bot. Néerl. 15 (1918) 49. — *Aidia oblongata* (Miq.) Tirveng. in Tirveng. & Sastre, Bull. Mus. Natl. Hist. Nat., B, Adansonia, 4e sér., 8 (1986) 271, p.p. *Stylocorma orophila*. — Type: Sumatra, Opper-Angkola, Junghuhn *s.n.* (L holo, sh. 908.221-721 — nót L sh. 908.223-199).

Randia forbesii King & Gamble, J. As. Soc. Beng. 72, ii (1903) 207; Ridley, J. Str. Br. Roy. As. Soc. 57 (1911) 112; J. Fed. Mal. Str. Mus. 10 (1920) 112; Fl. Malay Penins. 2 (1923) 76; Moore, J. Bot. 53, Suppl. (1925) 50. — *Aidia forbesii* (King & Gamble) Wong, Malayan Nat. J. 28 (1984) 17. — *Aidiopsis forbesii* (King & Gamble) Tirveng. in Tirveng. & Sastre, Bull. Mus. Natl. Hist. Nat., B, Adansonia, 4e sér., 8 (1986) 288. — Lectotype (Wong, 1984): *Scortechini 1308* (L iso), Malaysia, Perak.

Note — Valeton had already annotated the Leiden type sheet of *Randia forbesii* indicating that it was the same species as *Stylocoryna orophila* Miq. Tirvengadum seems to have confused the Junghuhn sheets, as the present type is annotated by him as *Aidiopsis* but placed in synonymy with *Aidia oblongata*.

Distribution — Thailand, Malay Peninsula, Sumatra, Java.

Representative materials: Beccari, Pl. Sum. 773; Phytochemical Survey of Malaya, KL 1785; Krukoff 4168; Lörzing 11355; Maradio 28; Meijer 5628; de Vogel 2450; de Wilde 18212, 20138.

3. *Aidia rugulosa* (Thwaites) Tirveng. = *Oxyceros rugulosa* (Thwaites) Tirveng. (as 'rugulosus').

Griffithia rugulosa Thwaites, Enum. Pl. Zeyl. (1859) 159. — *Randia rugulosa* (Thwaites) Bedd., For. Man. Bot. (1871) 133. — *Aidia rugulosus* (Thwaites) Tirveng., Ceylon J. Sci. 14 (1981) 3. — *Oxyceros rugulosa* (Thwaites) Tirveng., Nordic J. Bot. 3 (1983) 466 (as 'rugulosus'). — Type: Sri Lanka, Thwaites C.P. 245 (PDA holo; K iso), Sri Lanka.

from *Pelagodendron*:

4. *Pelagodendron congestum* (Schltr. & Krause) Tirveng. See 18. *Aidia congestum* (Baill.) Ridsdale.
5. *Pelagodendron vieillardii* (Baill.) Tirveng. See 17. *Aidia vieillardii* (Baill.) Ridsdale

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