REVIEW OF THE AUSTRALIAN SPECIES OF ACERATIUM (ELAEOCARPACEAE)

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While studying the generic delimitation between the New Guinea *Sericolea* and the Subantarctic genus *Aristotelia* of the *Elaeocarpaceae* I got the impression from the descriptions that all but one species of *Aristotelia* described from Australia would belong to *Aceratium*. Also in Australia obviously doubts had arisen concerning their proper generic disposition. C. T. White (Kew Bull. 1932: 42) had already reduced his *Aristotelia pubescens* to *Aceratium*. Moreover, all Queensland "*Aristotelias*" I received from Brisbane had been relabelled "*Aceratium*". As unfortunately no material of these species is represented in the Leyden Herbarium, my study is mainly based on material from the Brisbane and Melbourne Herbaria. This study confirmed that only *Aristotelia australasica* F. v. M. from New South Wales had been described in the proper genus.

In the present paper one new species and one new variety are described and one new combination is made in *Aceratium*, increasing the total of Australian species to five. As a fair amount of material has now become available, amplified descriptions are here presented of all species.

Thanks are due to the directors of the above mentioned Herbaria, to Dr Leenhouts and Dr Van Steenis for valuable criticism, and to Dr Bakhuizen van den Brink for help with the Latin text.

As can be seen from the key and the descriptions, the Australian *Aceratiums* fall apart into two groups. The first comprises *A. concinnum*, *A. doggrellii*, and *A. ferrugineum* which all fit well into the genus. The second group comprises *A. megalospermum* and *A. sericoleopsis*. Both these species differ from all others hitherto described in the essentially glabrous pedicels, calyx, disk, and ovary*), and the tapering filaments. In these characters they strongly remind one of *Aristotelia;* the shape of the leaves and the characters of indument and venation strongly suggest affinity with *Sericolea*. This holds especially for *A. sericoleopsis*. Contrary to all other *Aceratiums* described, their petals are broadest below the middle and the inflorescences are mostly terminal. I do not hesitate, however, to maintain these two species in *Aceratium* as they exhibit all other essential characteristics of this genus: the sigmoidally curved filaments, the oblong-linear anthers setiferous at the apex and dehiscing by an apical slit, the ovulation, and the drupaceous nature of the fruit. Within the genus they obviously deserve to be classified as a separate infrageneric taxon.

* In the Rijksherbarium, Leyden, there is a specimen of *Aceratium (Toxopeus 337)* collected in Buru, Moluccas, bearing an annotation by Mr Weibel "*ovarium glabrum, verisimiliter nov. spec.*" Moreover, I found the pedicels, calyx, and disk in this specimen to be glabrous, exactly as in the two aberrant Australian species, although it is not conspecific with any of these; unfortunately the material is rather scrappy, no fruits are present to allow a more detailed comparison.

KEYS TO THE AUSTRALIAN SPECIES

Fertile material

1. Pedicels, calyx, disk, and ovary glabrous; petals broadest below the middle.
   2. Fruit 1.8—3 cm long, with a ring-like ridge at the base. Leaves sericeous beneath, nervation dense, hardly prominent . . . . . **1. A. sericoleopsis**
   2. Fruit 1.1—1.8 cm long, shortly pointed at both ends. Leaves nearly glabrous, lateral nerves spaced, rather prominent on the lower surface of the leaf . . . . . **2. A. megalospermum**
1. Pedicels, calyx, disk, and ovary hairy; petals broadest above the middle.
   3. Petioles short, 2—3 mm. Leaves cordate at the base. . . . . **3. A. concinnum**
   3. Petioles at least 6 mm. Leaves not cordate.
      4. Leaves lanceolate, 4.5—8.5 by 1.5—2.5 cm, laxly hairy . . . . . **4. A. doggrellii**
      4. Leaves ovate to broad elliptic, 7.5—16 by 3.5—6.5 cm, densely ferruginously tomentose. **5. A. ferrugineum**

Sterile material

1. Petioles terete, leaves ovate to broad-elliptic, indument densely ferruginously tomentose. **5. A. ferrugineum**
1. Petioles sulcate above, leaves and indument different.
   2. Leaves cordate at the base. . . . . **3. A. concinnum**
   2. Leaves rounded to acute at the base.
      3. Petioles at least 6 mm, leaves oblong-obovate, slightly oblique. . . . . **4. A. doggrellii**
      3. Petioles not exceeding 4.5 mm.
         4. Leaves densely nerved, densely sericeous beneath, reticulation indistinct. **1. A. sericoleopsis**
         4. Leaves more remotely nerved, laxly sericeous, reticulation distinct. **2. A. megalospermum**

1. Aceratium sericoleopsis van Balgooy, *sp. nov.* — **Fig. 1.**

Arbor parva, ramulis teretibus sericeis. Folia elliptica ad oblongo-lanceolata, longe acuminata, crebre penninervia, supra glabra, subtus praecipue in marginibus anguste recurvatis dense sericea, denticulata. Petioli 1—4.5 mm longi. Inflorescentia ramulas laterales breves terminantes, pauciflora. Pedicellae 1.2—2.1 cm longae, apicem versus incrassatae. Sepala coriacea, ovato-lanceolata, 9—12 mm longa, marginibus inflexis, intus carinatis puberulis. Petala anguste oblongo-ovata, 11—15 mm longa, 2.5—3 mm lata, tridentata, intus cum elevatione mediana fere ad dimidiam attingente, marginibus inflexis, intus ad basin et ad elevationem et ad margines quoad partem 2/3 longitudinis villosa. Stamina 12—15, filamentis sigmoideis attenuatis, tota longitudine laxe hispidulis. Antherae minute hispidulae, apice setosae, 2.8—3.3 mm longae. Discus annularis glaber. Ovarium ellipsoideum, glabrum, 3-loculare, loculis 6-ovulatis. Stylus 9—12 mm longus, subulatus, glaber. Drupa ellipsoidea, monosperma, 1.8—3.0 cm longa, 1.0—1.6 cm lata, apice subacuta, basi annulata. Semen ellipsoideum 12 × 6 mm.

Typus: *C. T. White s.n.* in BRI.

Small tree *c.* 15 m, branches terete, densely covered with short sericeous hairs. *Leaves* elliptic to oblong-lanceolate, obtuse to subacute at base, long-acuminate at apex, 3.1—7.8 by 0.6—2.3 cm, closely penninerved, venation prominulous beneath, glabrous above, beneath densely sericeous which obscures the venation, margins slightly reflexed, thickened by dense sericeous hairs, denticulate; petioles sericeous, sulcate above rounded beneath, 1—4.5 mm. Stipules minute, filiform, 1—2 mm. *Inflorescence* a few-flowered raceme at the end of short lateral shoots. Pedicels glabrous, gradually thickened distally, 1.2—2.1 cm. *Flowers* (4—)5-merous, hermaphrodite. *Sepals* coriaceous, ovate-lanceolate, 9—12 by 2—2.5 mm, inflexed at the margins, with a median ridge inside, outside glabrous,

inside minutely appressed hairy especially on the ridge. *Petals* narrowly oblong-ovate, 11—15 by 2.5—3 mm, light-green, tridentate, margins inflexed, inside with a median ridge at the base extending to about halfway the petal, outside glabrous, inside at the base, on the ridge, and along the lower 2/3 of the margins densely villose. *Stamens* 12—15, in a single whorl or indistinctly in episepalous groups of three; filaments strongly sigmoid, tapering distally, 4—6 mm long, laxly hispidulous throughout; anthers linear, 2.8—3.3 by 0.4—0.5 mm, minutely hispidulous throughout, apically setiferous. *Disk* annular, slightly grooved, glabrous, 1—1.2 mm high. *Ovary* ellipsoid, *c.* 2 by 1.5 mm, glabrous, 3-celled, with 6 biseriate, anatropous, pendulous ovules per cell. Style subulate, 7—12 mm long, glabrous. *Fruit* an ellipsoid one-seeded drupe, 1.8—3 by 1—1.6 cm when dry, subacute at the top, at the base with an annular ridge 4—6 mm across and 2—3 mm high; fresh fruit dark red when ripe. Seeds ellipsoid, *c.* 12 by 6 mm.

Distribution: Northeast Queensland (only in the Atherton Tablelands).

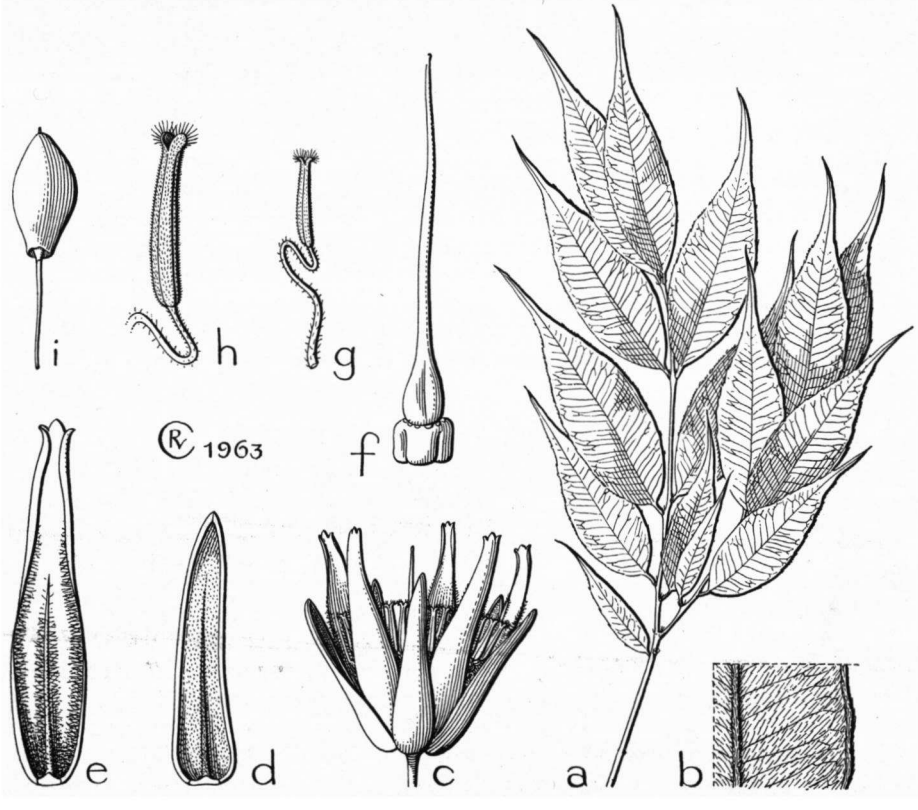

Fig. 1. *A. sericoleopsis* — a. Leafy twig, × ⅔; b. detail of lower leaf surface (indument actually more dense), × 2; c. flower, × 2; d. sepal, × 3; e. petal, × 3; f. pistil and disk (with scars of stamens), × 4; g. stamen, × 4; h. anther, × 8; i. fruit, showing basal annular ridge and distally thickened pedicel, × ½ (a, b, and i from *Smith 10496*; c—h from *C. T. White s.n.*).

QUEENSLAND. Cook District: Boonjie, Atherton Tablelands, *c.* 700 m, rain-forest, *Kajewski 1211* (BRI, K), small tree 10 m, fl. fr. Sept. 1929, petals light green, fr. dark red, 2.3 by 1.2 cm, pointed, leaves with silky brown hairs underneath; Gourka Pocket Road, Lamonds Hill (near Malanda), 700 m, *L. S. Smith 10496* (BRI), tree 15 m, sucker roots from lower trunk, fr. Nov. 1958, fr. reddish; Boonjie, Atherton Tablelands, *C. T. White s.n. (Type:* BRI), fl. fr. Jan. 1923; Atherton Tablelands, *K. J. White 181 (Q. F. 52/172)* (BRI), fr. *c.* 1952.

The new species, though obviously closely allied to *A. megalospermum*, is quite distinct from all other species of *Aceratium* by the closely silky lower surface of the leaves and its venation with dense, parallel lateral nerves which are only slightly prominent. Sterile material of this species could easily be taken for *Sericolea*, the more so as its leafshape agrees with that commonly found in the latter genus. In Brisbane this species had evidently already been recognized as a separate entity, the specimens belonging to it being set apart.

2. Aceratium megalospermum (F. v. M.) van Balgooy, *comb. nov.* — *Aristotelia megalosperma* F. v. M., Fragm. 9 (1875) 84; F. M. Bailey, Queensl. Fl. 1 (1899) 161. — *Aristotelia trilocularis* F. M. Bailey, Compr. Cat. Q. Pl. (1913) 835. — *Elaeocarpus corymbifer* Domin, Bibl. Bot. Heft 89 (1927) 928, t. 33.

Small tree, up to 15 m, outer bark brownish with scattered lenticels, twigs terete, sericeous when young. *Leaves* lanceolate or elliptic, 3.2—11.5 by 0.8—2.8 cm, obtuse to subacute at base, margins slightly reflexed and denticulate, acuminate, glabrous and smooth above, laxly sericeous beneath, lateral nerves 6—16, rather distinctly prominent beneath; petioles (1—)2—3(—4) mm, sulcate above, pubescent. Stipules when present minute, *c.* 1 mm long. *Inflorescence* usually terminal, generally on short axillary shoots, sometimes axillary, with 2—7 decussate flowers; peduncle laxly sericeous; pedicels thickening distally, 10—27 mm, glabrous or nearly so. *Flowers* 5-merous, hermaphrodite. *Sepals* oblong-lanceolate, 9—13 mm long and 2.5—3 mm broad at the base, acuminate, inflexed at margins and tip, with a well developed ridge inside, glabrous on both sides. *Petals* narrowly oblong-ovate, 10—17 by 2.5—3.5 mm, inflexed at the margins, tridentate at the apex, inside in the lower half with a broad median ridge, densely pubescent on the ridge and along the lower 2/3 of the margins. *Stamens* 12—15, in a single whorl; filaments sigmoid, tapering distally, 4—6 mm long, minutely puberulous at the base; anthers 3—3.8 mm long, shortly pubescent, hispidulous at the apex. *Disk* annular, grooved, 1—1.2 mm high, glabrous, persisting at the base of the fruit. *Ovary* ovate, 2—2.5 by 1.5 mm, glabrous, (2—)3(—4)-celled; ovules 5—6 per cell, biseriate and pendulous; style subulate, 9—14 mm, glabrous. *Fruit* ellipsoid to subglobose, subacute at both ends, 11—18 by 6—9 mm when dry, with a fibrous mesocarp and woody endocarp, containing a single ellipsoid seed; fresh fruit red when ripe.

The material belonging to this species is rather uniform, apart from two specimens which differ in a number of vegetative characters. Though it may seem a bit premature I think these differences are sufficiently constant to base a separate entity on them. Therefore I propose a subdivision into the following two varieties.

a. var. **megalospermum** — Leaves of firm texture but thinner than in var. *coriaceum*, nearly glabrous and rather large: (3.2—)4.5—9.5(—11.5) by (1—)1.3—2.2(—2.8) cm; lateral nerves more remote: 1.2—1.9 nerves per cm.

b. var. **coriaceum** van Balgooy, *var. nov.* — Differt a var. megalospermo foliis angustis magis coriaceis densiis sericeis, nervis lateralibus magis approximatis.

Typus; *Brass* 20027 in BRI.

The leaves of the new variety are coriaceous, rather small and narrow, (3.3—)4—5.5 (—6.3) by (0.8—)1—1.2(—1.4) cm, more or less sericeous underneath; the lateral nerves are more approximate than in the typical variety: 2—2.4 nerves per cm.

Distribution: Northeast Queensland (both varieties).

var. megalospermum

QUEENSLAND. Cook District: without precise locality, *C. J. Campbell s. n.* (BRI), fl. fr. Dec. 1914; Gap Creek (23 miles S. by E. of Cooktown), *c.* 90 m, rain-forest along creek banks, *L. S. Smith 10132* (BRI), small tree, 12 m, lower branches drooping, fl. Aug. 1959, fl. creamy white; Daintree River, *c.* 10 m, rain-forest, freshwater creeks, *Kajewski 1445* (BRI), small tree, 15 m, drooping branches, fr. Dec. 1929, fr. red when ripe, 1.4 by 1.3 cm, globular with pointed end; Mc Clean Creek, Bailey's Ck Area (near Daintree), 25 m, rain-forest, *L. S. Smith 11664* (BRI), tree 6 m, 10 cm Ø, st. Oct. 1962; Whyanbeel Ck, 5 miles NNW. of Mossman, 15 m, creek bank in rain-forest, *L.S. Smith 10044* (BRI), small tree, fl. Aug. 1957, fl. creamy white; Bellenden Ker Exp., *F. M. Bailey s. n.* (BRI, MEL), fl. June/July 1889; Babinda, 10 m, rain-forest, *Blake 15032* (BRI, MEL), small tree, trunk damaged, fl. July 1943, sepals reddish, petals cream; Babinda, *Mrs. Rowan s. n. (Type of Aristotelia trilocularis* F. M. Bail.: BRI, K), fragmentary, fr. Nov. 1912; Mt Bartle Frere, *Johnson s. n.* (MEL), fr. 1892; Russel River, *Johnson s. n.* (MEL), fl. fr. 1892; idem, Bank of Harvey's Ck, *W. Sayer 127* (MEL), fl. young fr. 1886; idem, Alice Ck, 10 m, *W. Sayer 233* (MEL), fr. 1887; Johnstone R., *Berthoud s. n.* (MEL), st. Dec. 1882; idem, *Johnson s. n.* (MEL), fl. 1889; idem, *Rev. N. Michael 177* (BRI), small tree, fl. fr. Sept. 1916; Berner Ck, via Innisfail, *W. R. Petrie s. n.* (BRI), fl. fr.; Paronella Park, Mena Ck *(c.* 14 miles S. of Innisfail), 15 m, *L. S. Smith 3717* (BRI), small tree, fl. Aug. 1948; Etty Bay, near Innisfail, light rain-forest, *C. T. White 11685* (BRI), shrub or small tree, straggling, fr. Dec. 1941, fr. red.; Mission Beach Area, Lacey's Ck, *L. S. Smith 4841* (BRI), small tree 15 m, 45 cm Ø, outer bark brownish, scattered lenticels, inner bark cream, greenish outer layer, wood pale, fr. Nov. 1951, fr. greenish then reddish, mesocarp fleshy. — North Kennedy: Tully Distr., *M. S. Clemens s. n.* (BRI), fl. fr. Dec. 1949; Rockingham Bay, *Dallachy s. n. (Type of Aristotelia megalosperma* F. v. M.: BRI, fr., MEL, st.); Murray R., *Collector unknown* (MEL), small spreading tree, small red fruit acid, fr. Dec. 1866; idem, *Collector unknown* (MEL), tree almost dead, fr. Jan. 1868.

var. coriaceum

QUEENSLAND. Cook District: Annan R., Upper Parrot Ck, *c.* 350 m, bank of stream in rain-forest, *Brass 20027 (Type:* BRI), tree 15 m. fl. fr. Sept. 1948, fl. greenish yellow; Johnstone R., *Rev. N. Michael 45* (BRI), tree, fr. Nov. 1915.

Aristotelia trilocularis Bailey, based on fragmentary fruiting material *(Rowan s.n.)*, was considered a distinct species, characterized by its 3-celled ovary. According to the original description the ovary of *A. megalospermum* F. v. M. should be 1—2-celled. The reason for so describing the ovary may be that the fruit often makes the impression of being 1- or 2-celled, as 1 or 2 cells often become abortive. In all material I have seen, I have found the fruit to be normally 3-celled, as in other Australian representatives of the genus; occasionally 2- or 4-celled fruits may be found as well.

I have not seen the material upon which Domin based his *Elaeocarpus corymbifer*, but from the description and figure it is clear that the type variety of *Aceratium megalospermum* is meant.

3. Aceratium concinnum (S. Moore) C. T. White, Kew Bull. (1932) 42. — *Elaeocarpus concinnus* S. Moore, J. Bot. 55 (1917) 303. — *Aristotelia pubescens* C. T. White, Q. Dept. Agr. Bot. Bull. 20 (1918) 5.

Tree, branches terete, densely pubescent. *Leaves* ovate to ovate-lanceolate, 4.5—12 by 2—4.5 cm, cordate, margins denticulate, acuminate, hairs on upper surface caducous (except on the midrib) leaving minute warts making the leaf scabrous above, lower surface densely fulvous tomentose-sericeous, lateral nerves 7—13, very prominent beneath, as are the reticulations; petioles sulcate above, 2—3 mm, densely pubescent.

Inflorescence mostly axillary, sometimes terminal on short axillary shoots, a short subumbellate raceme, 2—7-flowered; pedicels 3—6 mm, densely pubescent. *Flowers* 5-merous, hermaphrodite. *Sepals* lanceolate-ovate, 9—11 by 2 mm, outside densely pubescent, inside laxly puberulous, more densely so on the median rib. *Petals* narrowly obovate, 14—18 by 4 mm, cuneate, margins in the lower half slightly inflexed, 3-lobed, the lobes often bifid, inside at the base with a thick ridge, glabrous outside, inside at the base, on the ridge, and along *c.* 2/3 of the margins covered with short, dense, soft hairs which point backwards. *Disk* annular, grooved, *c.* 1 mm high, sericeous. *Stamens* 13—15, filaments slightly bent to sigmoid, 6—7.5 mm, minutely puberulous at the top, anthers oblong, 2—2.5 mm, minutely puberulous, hispidulous at the apex. *Ovary* ovoid, *c.* 2 mm, densely villose, 3-celled, with 6 ovules per cell. Style 13—14 mm, the lower half laxly strigose. *Fruit* ovoid to ellipsoid, subacute at both ends, 1.2—1.4 by 0.8 cm when dry, with fibrous mesocarp and woody endocarp, containing a single ellipsoid seed.

Distribution: Northeast Queensland.

QUEENSLAND. Cook District: Smithfield R. 1073, *B. Hyland 1825 (Q. F. 61/110)*, (BRI), fl.; Johnstone R., *Ladbrook s. n. (Type of Aristotelia pubescens* C. T. White: BRI), fl. — North Kennedy: Mission Beach Road (near Tully), *A. W. May 301* (BRI), fr. July 1951; Kirrama Ra. (W. of Cardwell), *E. Volck* Q. *F. 54/95* (BRI), small tree 10 m by 20—25 cm, st. Aug. 1953; Mt Spec, rain-forest, *C. T. White 9094* (BRI), large tree, st. March 1933.

4. Aceratium doggrellii C. T. White, Kew Bull. (1932) 42.

Tree up to 25 m by *c.* 40 cm Ø, bark light-grey, branches terete, short pubescent. *Leaves* obovate-spatulate, slightly oblique, 4.5—8.5 by 1.5—2.5 cm, cuneate, margins slightly reflexed, indistinctly denticulate, short-acuminate, short pubescent on the midrib above, laxly pubescent beneath; lateral nerves 6—10; petioles sulcate above, 6—10 mm, pubescent. *Inflorescence* an axillary raceme with 2—7 decussate flowers; peduncle 5—11 mm; pedicels 6—11 mm, pubescent as is the peduncle. *Flowers* 5-merous, hermaphrodite. *Sepals* ovate-lanceolate, 8—10 by 2 mm, inflexed at the margins, inside with a median ridge, outside pubescent, inside short appressed puberulous. *Petals* narrowly oblong-obovate, 12—14.5 mm long, 3 mm broad at the top, cuneate, tridentate at the apex, white, inside with a broad median ridge in the lower half, outside glabrous, the ridge and the lower 2/3 of the margins softly tomentose. *Disk* annular, weakly lobed, *c.* 1 mm high, pubescent. *Stamens* 15, indistinctly grouped in threes before the sepals; filaments sigmoid, *c.* 6 mm, puberulous at the top; anthers narrowly oblong, 3 mm, minutely puberulous, shortly setiferous at the apex. *Ovary* densely strigose, 3-celled, with 6 ovules per cell; style subulate, 8—10 mm, the lower part strigose. *Fruit* an oblong drupe, when dry 2.9—3.2 by 1.1 cm (3.5 by 2 cm when fresh), deep purple at maturity.

Distribution: Northeast Queensland.

QUEENSLAND. Cook District: Danbulla, State Forest Reserve 185, *Doggrell A 22 (Type:* BRI), tree 25 m, fl. white, fl. Oct. 1929; Forest Reserve 310, E. of Malanda, rain-forest, *K. J. White* Q. *F. 52/182* (BRI), tree 25 m, log 10 m, leaves from basal sucker, st. May 1952. — North Kennedy: Horse Shoe Bend Area near Ravenshoe, *Pearson s. n.* (BRI), fr. *c.* 1952; Ravenshoe Distr. Portion 25, *E. Volck* Q. *F. 51/244* (BRI), fl. buds Oct. 1951; Herberton Water Reserve and Timber Reserve 41, *K. J. White 154 (Q. F. 54/459)* (BRI), tree, log 10 m, tendency to sucker, fr. dark purplish 3.5 by 2 cm.

5. Aceratium ferrugineum C. T. White, Kew Bull. (1932) 43.

Tree up to 18 m, with drooping branches, bark reddish or brown, branches terete, densely rusty tomentose. *Leaves* ovate or obovate to elliptic, 7.5—16 by 3.5—6.5 cm,

obtuse at the base, margins indistinctly denticulate, the apex obtuse-acuminate, lateral nerves 7—14, looped and joined near the margin, venation beneath very prominent, densely pubescent beneath and on the midrib above; petiole terete, 9—16 mm, densely tomentose. *Inflorescence* a short, few-flowered, axillary raceme; peduncle and pedicels tomentose; pedicels 8—16 mm (in fruit to 2 cm). *Flowers* 5-merous, hermaphrodite. *Sepals* narrowly lanceolate, 10—12 by *c.* 2 mm, outside short-tomentose, inside short-pubescent especially on the slightly raised midrib. *Petals* narrowly spatulate, 15—16 mm long, 3—4 mm broad at the top, 3—5-dentate, inside with a median ridge in the lower 1/3, densely strigose inside at the base, on the ridge, and along the lower 2/3 of the margins, the hairs pointing backwards. *Filaments* weakly sigmoid or only slightly curved, 4—6 mm long, glabrous; anthers linear, 3.3—3.8 mm long, minutely hispidulous, setiferous apically. *Ovary* hirsute-strigose. *Fruit* an ellipsoid to ovoid, sometimes slightly angular drupe, when dry 2.7—3.6 cm long and up to 1.8 cm broad, the disk remaining as a hairy ring round the attachment of the stalk; mesocarp thick, fibrous, showing longitudinal cracks upon drying, endocarp woody, 3-celled.

Distribution: Northeast Queensland.

QUEENSLAND. Cook District: Slopes of Mt Lewis (near Mossman), 600 m, rain-forest, *L. S. Smith 10101* (BRI), st. 31-8-1957; idem, *L. S. Smith 10106* (BRI), fr. Aug. 1957; Mt Spurgeon, rain-forest, *C. T. White 10741* (BRI), fr. Sept. 1936; idem, overhanging watercourses near top of mountain, *Merrotsy 33 (Type:* BRI), fl. fr. Febr. 1923.

Flowers are only present in a very bad state and do not allow a complete description.