

STUDIES IN THE THEACEAE, XXVIII
MELCHIORA, A NEW GENUS IN AFRICA

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APPROXIMATELY ten years ago while reviewing the genus *Adinandra*¹ I was both impressed and intrigued by the presence of two unusual species quite isolated in Africa and far removed from the Asiatic-Malaysian taxa of the genus. Furthermore, these two African species were two thousand miles distant from each other. One, *Adinandra mannii* Baker, obviously a very rare species, has been found only on the tiny island of St. Thomas, close to but off the western coast of Africa in the Gulf of Guinea. The second species, *A. schliebenii* Melchior, was described from material collected near the eastern coast of Africa in the Territory of Tanganyika, separated from the first species by the span of the complete continent. In 1950, three years after my paper on *Adinandra* had been published, a third species *A. intermedia* Boutique & Troupin was described from Belgian Congo, Uganda and the Territory of Tanganyika. While having many fundamental characteristics of the genus *Adinandra* these three taxa have several distinct features which clearly set them apart.

Szyszyłowicz (1893) in his treatment of the family for *Die Natürliche Pflanzenfamilien* recognized in the one African species (*A. mannii*) described at that time enough differences to establish a new section *Eleutherandra* based primarily on the free stamens in the flower. Two other sections were introduced at the same time. The three sections were as follows:

- Sect. I. EULEUTHERANDRA: Stamens free
- Sect. II. EUADINANDBRA: Stamens in bundles
- Sect. III. SYMPHIANDRA: Stamens joined and disposed in a tube

Later, in 1925, Melchior continued the use of these sections but added a fourth, *Eleutherostyla*, separating his new section from those of Szyszyłowicz on the basis of the free styles. This last section of Melchior is now the New Guinea genus *Archboldiodendron*. At the time of his treatment Melchior stated that the knowledge of the stamens was too incomplete to group the species by sections, especially in Sections II and III, which comprise the Asian-Malaysian species and as a result treated all the species geographically. I found it expedient to follow Melchior's method of treatment for two reasons. In the first place, except for the taxa *A. millettii* (China) and *A. dumosa* (Malaysia) the species are endemics of very limited range. Secondly, eight out of every ten specimens of *Adinandra* have been collected in the fruiting stage and many taxa have been described from the fruit alone. Furthermore, it is difficult, in working with

¹ Studies in the Theaceae, XV. A review of the genus *Adinandra*. Jour. Arnold Arb. 28: 1-98. 1947.

herbarium material, to place a species definitely in its respective section even with the stamens present.

The second species of the African section *Eleutherandra*, *A. schliebenii*, was described by Melchior in 1934. In this treatment Melchior gave a very interesting and enlightening discussion of the species, quoting excerpts from a letter written by the collector, H. J. Schlieben and contrasting the new taxon with *A. mannii* described sixty-six years earlier.

Besides the free stamens used as a means of separating these three species from the other taxa in *Adinandra* there are other features of importance which set them apart and which taken together form a group worthy of generic distinction.

The features of distinction are as follows: (1) Stamens few, in a single series, the filaments glabrous and free except at the very base, the anthers glabrous (without setae) and subsagittate; (2) Corolla-lobes orange and red, three times longer (35–50 mm.) than the calyx-lobes, connate at the base only, otherwise free, disposed in a pseudo-tube, the apices of the lobes arching over the pistil and stamens.

The feature of relationship with *Adinandra* is found in the fruit. The indehiscent capsules are 4-celled, incompletely 5-celled or 5-celled, with many small, reniform, shiny seeds. The placentae are bifid.

It is a pleasure to name this new genus *Melchiora* for Professor Hans Melchior of the Botanisches Museum at Berlin-Dahlem, Germany. For years Professor Melchior has shown a continued interest in and has made many valuable contributions to our knowledge of the family Theaceae. The section name *Eleutherandra* is not available for generic use since it has been used by Van Slooten (1925) for a genus in the Flacourtiaceae. Another name, *Adinandropsis* has been published as a *nomen nudum*.

Melchiora, gen. nov.

Adinandropsis Pitt-Schenkel in Jour. Ecol. 26: 80. 1938, nom. nud.

Arbores. Folia alternata, simplicia, chartacea vel subcoriacea, penninervia. Flores hermaphroditi, in axillis foliorum solitarii; bracteolae duae, persistentes; sepala quinque, imbricata, concava, persistentia, crassa inaequalia, exteriora satis breviora; petala quinque, libera; stamina uniseriata, pauca (15–35), filamentis filiformibus, glabris, liberis (inter se), basi ad corollam adnatis, antheris glabris (sine setis), basi cordato-sagittatis, apice apiculatis; ovarium quattorloculare, vel quinqueloculare, multi-ovulatum, placenta in quoque loculo bifida, stylo filiformi, stigma leviter quinqsulcatum. Fructus indehiscens, in sicco subligneus, sepalis bracteo-
lisque persistentibus. Semina in quoque loculo multa, parva, reniformia, testa brunnea, nitida, reticulata.

TYPE SPECIES: *M. mannii* (*Adinandra mannii* Baker).

KEY TO THE SPECIES

Young branchlets tuberculate-punctate; leaves subrotund at the base; ovary 4-celled, glabrous; style glabrous. *M. mannii*.

Young branchlets smooth; leaves cuneate at the base; ovary 5-celled, sericeous; style sericeous on lower portion, glabrous upper part.

Petals acute and entire at the apex; the inner three sepals sericeous on the dorsal surface, the outer two glabrous; stamens 15–20. *M. schliebenii*.

Petals obtuse or rounded and denticulate at the apex; all sepals glabrous without, sericeous within; stamens 25–35. *M. intermedia*.

Melchiora mannii (Oliver), comb. nov.

Adinandra mannii Oliver in Fl. Trop. Afr. 1: 170. 1868. — Hooker, Icon. Pl. 11: 29, t. 1039. 1867. — Szyszyłowicz in Nat. Pflanzenfam. III. 6: 189. 1893. — Melchior in Notizbl. Bot. Gart. Mus. Berlin 8: 657. 1924; 11: 1100. 1934; in Nat. Pflanzenfam. ed. 2, 21: 144. 1925. — Exell, Cat. Vasc. Plts. S. Tomé 112. 1944. — Kobuski in Jour. Arnold Arb. 28: 94. 1947. — Boutique & Troupin in Bull. Jard. Bot. Bruxelles, 20: 65. 1950.

DISTRIBUTION: West Africa (Island of St. Thomas).

ISLAND OF ST. THOMAS: summit of the peak on the island, *G. Mann 1066* (ISOTYPE, GH).

Tree 10 m. high; branches gray, terete, glabrous, the young branchlets red-brown, glabrous, terete, minutely tuberculate-punctate, the terminal buds glabrous. Leaves chartaceous to subcoriaceous, oblong-elliptic to oblong-obovate, quite uniform in size, 6–7 (–9) cm. long, 2–3 cm. wide, acuminate at the apex, asymmetrical, subrotund at the base, glabrous on both surfaces, the midrib reddish near the base, tuberculate-punctate on the lower surface, the margin glandular-denticulate, the veins 15–18 pairs, conspicuous but not prominent, anastomosing midway to the margin, the petiole 1–2 mm. long. Flowers axillary, ? solitary; pedicel ca. 2 cm. long (fide Oliver), glabrous; bracteoles 2, persistent, glabrous, opposite, immediately below the calyx, broadly ovate, 7–8 mm. long, 5–6 mm. wide, acute at the apex, carinate; calyx-lobes 5, imbricate, glabrous on the exterior surface, very lightly appressed-pubescent (with binocular) on the interior surface, broadly ovate, acute at the apex, unequal, the two outer lobes 12–14 mm. long, ca. 10 mm. wide, the three inner lobes 17–19 mm. long, ca. 10 mm. wide, their inner margins scarious, entire; corolla-lobes 5, slightly connate only at the very base, not spreading, somewhat tubuliform, oblong, ca. 25 (35–45) mm. long, 7–10 mm. wide, obtuse to subrotund at the apex; stamens ca. 30 in a single series, equal, ca. 10 mm. long, the filaments glabrous, ca. 6 mm. long, adnate to the base of the corolla, otherwise free, the anthers oblong-linear, ca. 4 mm. long, strictly glabrous, the apicule less than 0.5 mm. long, truncate to emarginate; ovary conical-ovoid, glabrous, ca. 4 mm. diam., tapering into the style, 4-celled, multi-ovulate, the placentae bifid, the style glabrous, entire, ca. 22 mm. long, the stigma 4-lobed. Fruit not seen.

An examination of the isotype in this species shows that the ovary is distinctly 4-celled. A 4-celled ovary is unusual in the Theaceae. However, in *Adinandra* two species, *A. myrioneura*, of British North Borneo, and

A. oblonga, of Siam, have 4-celled ovaries with innumerable small ovules, like that found in this species.

One might expect, from an examination of more material of the species, to find specimens in which the ovary is 5-celled as in *M. intermedia*. According to Exell, however, the species may be no longer in existence. In his Catalogue of the Vascular Plants of S. Tomé (p. 113. 1944) he states: "I made a hasty search for *A. Mannii* on the Pico in November 1932, but without success. A tremendous rainstorm was in progress and one could see only a few yards. The vegetation near the summit of the Pico has been partially cleared and some *Cinchona* planted, so that it is possible that *A. Mannii* is now extinct. It was last collected by Campos in 1907."

There are other isolated species in the Theaceae that have suffered a like fate. *Freziera cordata* Tulasne, known only from Martinique, was obliterated in the devastating volcanic eruption of Mt. Pelée on that island in 1902. *Franklinia alatamaha* Marshall, found only in Georgia near Fort Barrington in McIntosh County, was last collected in the late eighteenth century. This species was probably exterminated as a spontaneous plant in the years 1787 and 1789 by nurserymen in an effort to fill large orders for the species for a London firm.

Melchiora schliebenii (Melchior), comb. nov.

Adinandra schliebenii Melchior in Notizbl. Bot. Gart. Mus. Berlin 11: 1076, 1097. 1934. — Kobuski in Jour. Arnold Arb. 28: 95. 1947. — Boutique & Troupin in Bull. Jard. Bot. Bruxelles, 20: 65. 1950.

DISTRIBUTION: East Africa (Tanganyika Territory).

TANGANYIKA TERRITORY: Uluguru, in fog forest northwest side of Lupanga Mountains; tree 20–30 m., flowering and fruiting, with orange and red flowers, *H. J. Schlieben* 3175, (ISOTYPE, AA), December 28, 1932.

Tree 20–30 m. high; very young branchlets smooth, compressed, glabrous, red to gray-brown. Leaves chartaceous to coriaceous, obovate-oblong, 5–10 cm. long, 2–3.5 cm. wide, acute at the apex or shortly and obtusely acuminate, cuneate at the base, glabrous on both surfaces, the midrib red beneath, the margin serrulate-dentate, glandular, the veins conspicuous beneath because of the red color, the petiole ca. 5 mm. long. Flowers axillary, solitary, ca. 3 cm. long; pedicels 2.5–3.5 cm. long, recurved, glabrous; bracteoles 2, persistent, opposite, immediately below the calyx, glabrous, broadly ovate, acute at the apex, carinate, the outer one 3 mm. long and wide, the inner one 5 mm. long and wide; calyx-lobes 5, imbricate, ovate, acute at the apex, unequal, varying in length from 10 mm. (outer lobe) to 17 mm. (inner lobe), ca. 12 mm. wide, the two outer lobes glabrous on the exterior surface, the three inner lobes sericeous on the exterior surface except along the scarious margins, ciliolate; corolla-lobes 5, free, twice as long as the innermost calyx-lobe, linear-oblong, 32–45 mm. long, 5–7 mm. wide, acute at the apex, somewhat narrowed and connate at the base, not spreading, somewhat tubuliform; stamens 15–20, uni-

seriate, ca. 15 mm. long, glabrous, the filaments free (inter se), adnate to the base of the corolla, filiform, 8–9 mm. long, the anthers linear, ca. 5 mm. long, cordate-sagittate at the base, the connective projected at the apex into a small subulate-lanceolate apicule 1 mm. long; ovary conical, ca. 6 mm. long, 4 mm. diam., sericeous-tomentose, imperfectly 5-celled, multi-ovulate, attenuate at the apex into a filiform style 24–30 mm. long, sericeous along the lower portion, glabrous along the upper portion, lightly 5-sulcate, the stigma minute, lightly 5-sulcate. Fruit indehiscent, conical-ovoid, ca. 2 cm. long, 1 cm. diam., the seeds many, small, reniform, 1.2–1.5 mm. diam., brown, shiny, reticulate.

Whereas *Melchiora mannii* has been shown to have been a rare species of very limited geographical range, *M. schliebenii* is known to enjoy a well-established stand in Tanganyika Territory. Quoting from a letter by the collector (H. J. Schlieben), Melchior records a stand of many trees and that the species seems to flower throughout the year. He mentions that on the east side of Magali Mountain (alt. 2450 m.), seventy percent of the trees are of this species. The trees are severely forked at this altitude. He also states that the heartwood is very hard and red in color.

There are other instances in the family Theaceae in which species are known to dominate isolated areas. On the tabletop mountains in Venezuela three species of *Bonnetia* are sufficiently abundant to form what are known as "Bonnetia forests." On Ptari-tepuí one finds *B. steyermarkii* forming impenetrable thickets and also mixed with *B. roraimae* in "Bonnetia roraimae forests." *Bonnetia sessilis* is the dominant species on the mesa between Ptari-tepuí and Sororopan-tepuí. All of these species, although abundant, are strict endemics.

***Melchiora intermedia* (Boutique & Troupin), comb. nov.**

Adinandra intermedia Boutique & Troupin in Bull. Jard. Bot. Bruxelles, 20: 62. 1950.

Adinandropsis, sp. nov. Pitt-Schenkel in Jour. Ecol. 26: 80. 1938, nom. nud.

DISTRIBUTION: Belgian Congo, Uganda, Tanganyika Territory. — Fide Boutique & Troupin.

NO SPECIMENS EXAMINED.

Trees erect, up to 40 m. high; branchlets glabrous, leaves generally disposed at the ends of the branchlets, chartaceous to submembranaceous, elliptic, oblong-elliptic or obovate, 7–13 (–18) cm. long, 2–4 (–6) cm. wide, acute or shortly acuminate at the apex, cuneate at the base, glabrous on both surfaces, green above, pale or yellow-green below, the midrib sulcate above, somewhat prominent beneath, the secondary nerves 17–20, red, the margin serrulate-dentate, the petiole ca. 5 mm. long. Flowers axillary, solitary, 3.5–5 cm. long; pedicel 1–3 cm. long, glabrous; bracteoles 2, persistent, unequal, suborbicular, often subacute at the apex, the outer one 2–4 mm. long and wide, the inner one 7–9 mm. long and wide; calyx-lobes 5, imbricate, unequal, 1.5–3 cm. long, 1.2–1.6 cm. wide, the outer one

often subrotund at the apex, the others acute at the apex, glabrous externally, sericeous within; corolla-lobes 5, free, glabrous, erect, slightly connate at the base, somewhat tubular, 3.5–5 cm. long, 5–7 mm. wide, obtuse to rounded and denticulate at the apex; stamens 25–35, uniseriate, 11–16 mm. long, glabrous, the filaments free, filiform, 6–8 mm. long, lightly adnate to the base of the corolla, the anthers linear, cordate-sagittate, 5–8 mm. long, the connective projected at the apex into a small subulate-lanceolate apicule 0.7–1.5 mm. long; ovary conical, 5–10 mm. long, 3–6 mm. across, sericeous-tomentose, 5-celled, multi-ovulate, alternate at the apex into a filiform style 3–5 cm. long, sericeous along the lower portion, glabrous toward the apex, the stigma minute, lightly sulcate. Fruit indehiscent, conical-ovoid, 2–3 cm. long, ca. 1 cm. across, the seeds many, reniform or discoid, ca. 1 mm. diam., reticulate.

Unfortunately, none of the four specimens cited by Boutique & Troupin has been available for this study. However, in preparing an English description, I was impressed by the great similarity between *M. intermedia* and the earlier species, *M. schliebenii* described by Melchior.

The apex of the corolla-lobes is described as obtuse to rotundate and denticulate. As illustrated in the original publication, this denticulation appears very distinctive. Another character, the absence of pubescence on the external surface of the inner lobes of the calyx also distinguishes the species from *M. schliebenii*.

The other differences of importance appear to be those of size. I list below a comparison of these sizes as found in the two taxa *M. schliebenii* and *M. intermedia*. One will observe that there is greater variation listed for *M. intermedia* than for *M. schliebenii*. It is also obvious that in these two taxa the listed measurements are equal or overlap. Probably the reason is because Boutique & Troupin had four specimens from which to draw their conclusions while Melchior described his species from a single specimen.

	<i>M. schliebenii</i>	<i>M. intermedia</i>
HABIT:	Tree 20–30 m. high; severely forked	Trees to 40 m. high; erect
LEAVES:	5–10 cm. long; 2–3.5 cm. wide	7–13 cm. long; 2–4 cm. wide
PETIOLE:	5 mm. long	5 mm. long
PEDICEL:	2.5–3.5 cm. long	1–3 cm. long
BRACTEOLES:	outer: 3 mm. long & wide inner: 5 mm. long & wide	outer: 2–4 mm. long & wide inner: 7–9 mm. long & wide
SEPALS:	10–17 mm. long, 12 mm. wide	15–30 mm. long, 12–16 mm. wide
PETALS:	32–45 mm. long, 5–7 mm. wide	35–50 mm. long, 5–7 mm. wide
FILAMENTS:	8–9 mm. long	6–8 mm. long
ANTHERS:	5 mm. long	5–8 mm. long
CONNECTIVE:	1 mm. long	1 mm. long
OVARY:	6 mm. long, 4 mm. diam.	5–10 mm. long, 3–6 mm. diam.
STYLE:	24–30 mm. long	30–50 mm. long

The distribution of *M. intermedia* as recorded by the authors appears to be far more extensive than that of the other two taxa. In fact, it almost invades the area recorded for *M. schliebenii*, since it has been recorded from Usambara (*Pitt-Schenkel* 376) in the Territory of Tanganyika, a locality only a little more than a hundred miles north along the coast from the type locality of *M. schliebenii*.

Another interesting comparison is that Schlieben, the collector of *M. schliebenii*, records his material as coming from an area in which the tree is the dominant element of the flora. Michelson, the collector of the type of *M. intermedia*, also records his specimen as coming from an area in which this species is the dominant element.

It seems that in the case of these two species, both dominating the flora of rather extensive localities which perhaps overlap, an opportunity to make a population study of the taxa in the woody family Theaceae may be afforded. This is indeed a rare opportunity, since the species in this family are usually isolated indigens and are seldom found growing abundantly or in close enough proximity to warrant such a study. Considering the great variation found within the taxa of this family, further study of ample material may show *M. schliebenii* and *M. intermedia* to constitute a single variable species.



Kobuski, Clarence Emmeren. 1956. "Studies in the Theaceae, XXVIII Melchiora, a New Genus in Africa." *Journal of the Arnold Arboretum* 37(2), 153–159.
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