

A revision of the genus *Alloneuron* PILG. and segregation of *Wurdastom* gen.n. (Melastomataceae)

B. Wallnöfer*

Abstract

The genus *Alloneuron* (Melastomataceae) is reviewed. It has a very unusual habit and a unique combination of morphological features within the family: pinnate leaf venation (semicraspedodromous or mixed craspedodromous, instead of acrodromous), haplostemony, capsular fruits originating from an inferior ovary. *A. liron* sp.n. is described from Peru. A determination key is presented. From the author's field observations, the growth form of *A. majus* can be assigned to "Chamberlain's architectural tree model" as described by HALLÉ et al. (1978). The growth form of *A. ulei*, however, shows a mixture of "Chamberlain's" and "Leeuwenberg's model". The new genus *Wurdastom* is described to include 8 species described by WURDACK, which do not fit the generic circumscription of *Alloneuron*.

Key words: Flora of South America, Colombia, Peru; Melastomataceae, *Alloneuron*, *Meiandra*, *Wurdastom* gen.n.; growth form, Chamberlain's and Leeuwenberg's architectural tree model.

Zusammenfassung

Die Gattung *Alloneuron* (Melastomataceae) wird einer Überprüfung unterzogen und enthält nunmehr 3 Arten, wovon eine neu beschrieben wird: *A. liron* aus Peru. Diese Gattung zeigt innerhalb der Melastomataceae einen ungewöhnlichen Habitus und ist durch die einzigartige Kombination folgender Merkmale gekennzeichnet: fiederige Blattnervatur (semicraspedodrom oder gemischt craspedodrom anstelle von acrodrom), Haplostemonie, sowie Kapselfrüchte, die sich aus unterständigen Fruchtknoten entwickeln. Ein Bestimmungsschlüssel wird vorgestellt. Die Wuchsform von *A. majus* entspricht aufgrund eigener Feldbeobachtungen "Chamberlain's architectural tree model" wie von HALLÉ & al. (1978) beschrieben. *A. ulei* zeigt hingegen eine Mischung aus "Chamberlain's" und "Leeuwenberg's model". Acht von WURDACK beschriebene Arten werden abgetrennt und in der neuen Gattung *Wurdastom* zusammengefaßt, da sie der bestehenden Gattungsbeschreibung von *Alloneuron* nicht entsprechen.

Introduction and history of the genus *Alloneuron*

The genus was described from a Peruvian specimen collected by Ule (*A. ulei*), and tentatively placed within the "group of Tamoneae" by PILGER (1905). Twenty-one years later MARKGRAF (1927) described the genus *Meiandra*, based on two Peruvian collections of Tessmann (*M. maior* and *M. minor*) and tentatively placed it in tribe Meranieae TRIANA. In the course of his work on the Flora of Peru, MACBRIDE (1929) realized that *Meiandra* and *Alloneuron* were congeneric. With the agreement of MARKGRAF he consequently placed *Meiandra* in synonymy under *Alloneuron*. In a series of papers, WURDACK (1971, 1974, 1981, 1990) described 8 new species of *Alloneuron*. However, these species do not fit the generic circumscription of *Alloneuron* and are included here in the new genus *Wurdastom*.

* Dr. Bruno Wallnöfer, Botanische Abteilung, Naturhistorisches Museum, Burgring 7, A-1014 Wien, Österreich (Austria).

In Flora of Ecuador (WURDACK 1980: 315) "*Alloneuron* HOOKER f." is given as synonym of *Loreya* DC. This is obviously a mistake for *Heteroneuron* HOOKER f. Later on, this wrong information has been perpetuated by MABBERLEY (1987) and WIELGORSKAYA (1995).

According to MACBRIDE (1929), Prof. Record pointed out that the wood structure of *Alloneuron* "is normal" and "it accordingly seems probable that *Alloneuron* is a member of Melastomeae and related to *Miconia*". WURDACK (according to WELLE & KOEK-NOORMAN 1981: 374) considered *Alloneuron* to belong to tribe Cyphostyleae GLEASON. MENTINK & BAAS (1992) and RENNER (1993) later erroneously ascribed this conclusion to GLEASON (1929), who, however, did not mention this genus at all. RENNER (1993) did not recognize tribe Cyphostyleae and included *Alloneuron* in tribe Miconieae DC. WELLE & KOEK-NOORMAN (1981) analyzed the wood anatomy of *A. subglabrum* WURDACK (= *Wurdastom subglabra*, see below) and found it in "good agreement with the Miconieae". Both genera belong to tribe Miconieae as currently defined (RENNER 1993).

Alloneuron has a very unusual habit in the family and resembles Gesneriaceae. It is characterized by a unique combination of features within the family, of which the characteristic pinnate leaf venation is the most distinctive. The leaf venation pattern is semicraspedodromous or mixed craspedodromous, and not acrodromous (HICKEY 1979) as is normally the case in this family. The leaf anatomy of *Alloneuron ulei* has been studied by MENTINK & BAAS (1992), who stated: "*Alloneuron* stands out [of all treated other genera] by the occurrence of many hair types and mainly polocytic stomata."

The flowers are haplostemonous. The protologue of *Alloneuron* indicated the flowers as being 4-merous, whereas the protologue of *Meiandra* mentioned 4- to 5-merous flowers. According to my own observation, the flowers are normally 5-merous and only rarely 4-merous on the same individual.

The fruits are dry capsules, originating from an inferior ovary. PILGER (1905) describes the fruits of *Alloneuron* as 2-locular, irregular splitting capsules, whereas MARKGRAF reports (without more information) 3-locular fruits for his two species of *Meiandra*. MACBRIDE (1929) erroneously described the fruits as numerous-seeded berries, correcting this in the Flora of Peru (MACBRIDE 1941). The capsules of *A. ulei* and *A. liron* are normally 3-locular, whereas those of *A. majus* are 5-locular with exception of the collection Vasquez & al. 18500, which shows 3-locular ones. Rarely some 2- or 4-locular fruits can also be found in the above-mentioned species. The capsules open, from my own observations, at their apices by 3 or 5 (no 2- or 4-locular capsules were observed at this stage) radial slits, and subsequently irregularly split downwards to the basal part of the fruit wall, which originated from the inferior part of the ovary (fig. 4D, 6D). The old, ruptured capsules are long persistent, showing the intact central column and the characteristic, star-like (perpendicular to the axis) divergent, enlarged placentae (fig. 3C, 4E, 6E).

Description of the indumentum

The genera of Melastomataceae show a great variety of hair types (WURDACK 1986), which are very important in the systematics in this family. *Alloneuron* possesses 5 different hair types, very important for species delimitation. These types are described below.

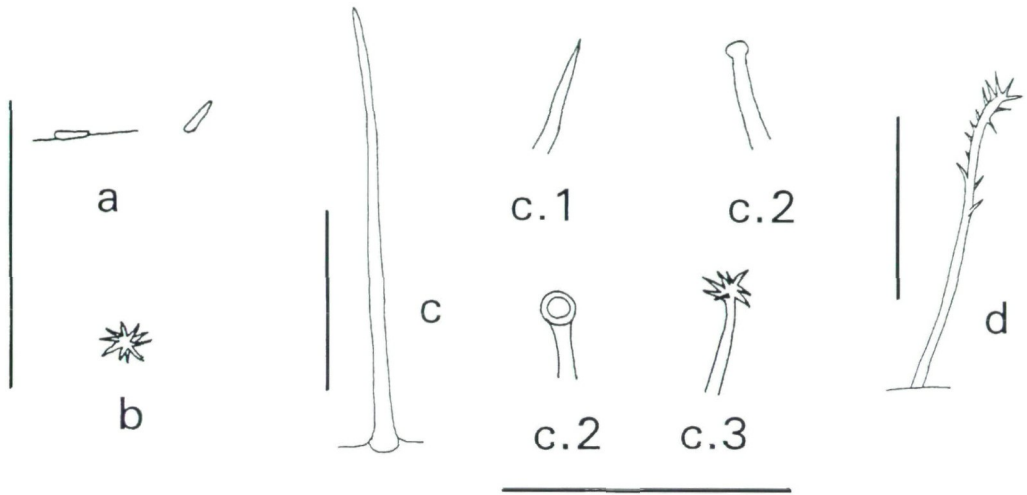


Fig. 1: Indumentum types (Bar = 1 mm).

"type a" (fig. 1a): oblong, ca. 0.08 mm long, appressed, hair-like, epidermal structures.

"type b" (fig. 1b): stellate, multi-branched, exstipitate hairs, with a diameter of ca. 0.13 - 0.16 mm.

"type c" (fig. 1c): ciliform trichomes, (0.5 -) 1 - 3.5 (- 4) mm long, straight or curved, spreading, unbranched, smooth, slightly and gradually thickening towards base, with three different forms of apices: sharply pointed ("type c.1"); in sicco enlarged, truncate, often oblique and slightly bowl-shaped point = collapsed glands? ("type c.2"); and point with a tuft of short, spreading appendages ("type c.3", no example of this characteristic hair type is shown in WURDACK [1986], but it is described as "stipitate-stellulate" in WURDACK [1971]).

"type d" (fig. 1d): ciliform trichomes like "type c", (0.5 -) 1 - 2 mm long, straight or tortuous or curved towards apex, patent, unbranched, asperous on distal half (rarely towards base), with scattered appendages, pointing forward or directed to the side; apically with a tuft of spreading, short appendages.

"type e": bristles (0.2 -) 0.3 - 1 cm long, with sharply pointed apices; only occurring on stem nodes.

Taxonomy and Systematics

Alloneuron PILG.

Verh. Bot. Ver. Prov. Brandenburg 47: 185 (1905).

Type species: *Alloneuron ulei* PILG.

= *Meiandra* MARKGR., Notizbl. Bot. Gart. Berlin-Dahlem 9: 1142 (1927).

Lectotype species: *Meiandra maior* MARKGR. (here designated).

Key to the species

- 1 Leaves ca. 20 x 6 cm, loosely arranged on shoot apices, mostly more than 4 leaf pairs present at a time; flowers and fruits 2 - 7 mm distant from each other on long, filiform inflorescence- (infructescence-) branches (sect. *Alloneuron*) *A. ulei*
- 1* Leaves ca. 33 x 11 cm, tufted on shoot apices, only 2 - 3 leaf pairs present at a time; flowers and fruits crowded on short inflorescence- (infructescence-) branches (sect. *Meiandra*) 2
- 2 Inflorescences (infructescences) at base mostly with several, long stalks of partial-inflorescences (-infructescences); stalks densely covered with small, stellate hairs of "type b" (see section on indumentum) and long, patent hairs of "type c.3"; petals ovate, gradually narrowed into a tip, 4 - 4.5 mm long, 1.5 - 1.8 mm wide; secondary and smaller (higher order) veins on abaxial leaf surfaces covered with small, stellate hairs of "type b" and long, patent hairs of "type c.2", rarely "type c.3" *A. liron*
- 2* Inflorescences (infructescences) only with one long stalk (peduncle), which is densely covered only with small, stellate hairs of "type b"; petals broadly lanceolate to slightly obovate, apically truncate, 4.3 - 5 mm long, 2.6 - 3.2 mm wide; secondary and smaller (higher order) veins on abaxial leaf surfaces covered only with stellate hairs of "type b" *A. majus*

Section Alloneuron

***Alloneuron ulei* PILG.**, Verh. Bot. Vereins Prov. Brandenburg 47: 185 (1905); (fig. 2 - 3)
 Type: Peru, Dept. Loreto [today: Dept. San Martín], am Felsen am Pongo de Cainarachi [today "Shanusi": 76°15' W, 6°07' S], (fl + fr), Sept. 1902, E. Ule 6417 [holotype: B, destroyed, photo 17396 ex F at MO, US; isotypes: G n.v., fragment at F; K n.v., photo 90-11 ex NY at F, US; MG n.v., fragment and photo at F]; annotations on the label: "kleiner Strauch 0,3 - 0,7 m; Bl[üten] gelblich" (= small shrub of 0,3 - 0,7 m; flowers yellowish).

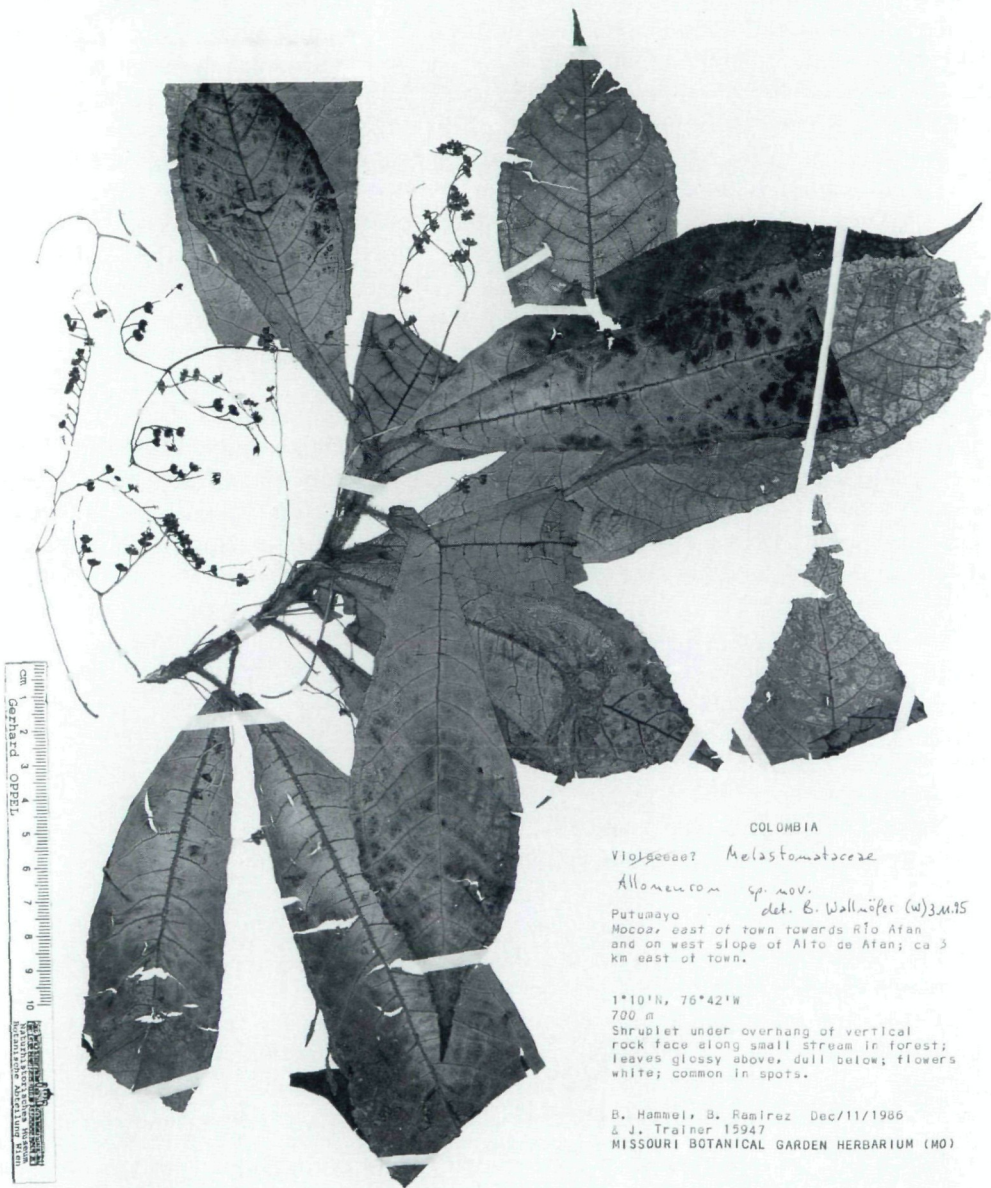
= *Meiandra minor* MARKGR., Notizbl. Bot. Gart. Berlin-Dahlem 9: 1142 (1927)

Type: Peru, Ost-Peru, oberer Marañon, am Pongo de Manseriche, 158 m, an felsigen Stellen der Abhänge, besonders da, wo Feuchtigkeit vorhanden, etwa 10 - 20 m über dem Wasserspiegel, (fl), 30. Nov. 1924, G. Tessmann 4853 [holotype: B, destroyed, isotypes not located].

Small shrub [for growth form see below]; shoots terete, densely covered with 1 - 3 mm long hairs of "type d" and stellate hairs of "type b"; leaf axils with tufts of brown, 2 - 5 mm long bristles of "type e"; internodes 0.5 - 3.5 cm long; petioles: 0.5 - 2 cm long, densely covered with stellate hairs of "type b" and quite densely with long hairs of "type d"; leaves: opposite, chartaceous, pinnately veined (semicraspedodromous; secondary veins straight or slightly curved, 0.5 - 1.5 cm distant from each other); lamina oblanceolate, gradually attenuate or long attenuate towards base; mature leaves (5.5 -) 10 - 18 (- 22.5) cm long, 1.8 - 6 cm broad, widest at upper 1/3 of the lamina; apices attenuate-acuminate, 1 - 2 cm long; bases slightly enlarged, slightly peltate or auriculate, sometimes oblique; margins, especially on distal half, sinuate-denticulate; leaves with trichomes of "type a - d": the smallest corresponding to "type a" scattered on both surfaces of younger leaves, quite rare on older ones; stellate hairs of "type b" very rare on adaxial leaf surfaces, except on midvein at base of lamina; on abaxial leaf surfaces these hairs crowded

PHOTOTHEK
NR. 463


NATURHISTORISCHES MUSEUM WIEN
BOTANISCHE ABTEILUNG



COLOMBIA
Violaceous? Melastomataceae
Alloneuron sp. nov.
det. B. Wallnöfer (W) 3.11.75
Putumayo
Mocora, east of town towards Río Atán
and on west slope of Alto de Atán; ca 3
km east of town.

1°10'N, 76°42'W
700 m
Shrublet under overhang of vertical
rock face along small stream in forest;
leaves glossy above, dull below; flowers
white; common in spots.

B. Hammel, B. Ramirez Dec/11/1986
& J. Trainer 15947
MISSOURI BOTANICAL GARDEN HERBARIUM (MO)

Fig. 2: *Alloneuron ulei* (Hammel et al. 15947 [W]).

along the main veins especially towards base; on secondary veins more scattered and on tertiary veins more or less solitary; on adaxial leaf surfaces 1 - 2 mm long, scattered hairs of "type c.2" present, showing small globose apices; on abaxial leaf surfaces, 0.5 - 1 mm long hairs of "type c.2", scattered or isolated along secondary and tertiary veins; primary veins quite densely covered with (0.7 -) 1 - 2 mm long hairs of "type d" on abaxial leaf surfaces; primary and secondary veins on adaxial leaf surfaces markedly verrucose; leaf margins with 1 mm long, remote hairs of "type c.2" (with more or less globose apices), or rarely of "type c.1"; inflorescences (terminal!) and infructescences (mostly pseudolateral! - see chapter growth form): 5 - 15 cm long, 6 - 7 cm long stalked (only rarely and probably after flowering 1 or few additional stalks with smaller inflorescences arising at base of the main stalk); inflorescence composed in the rare, ideal case of 2 pairs of opposite, branched, filiform, partial-inflorescences similar to fig. 6.b in SELL & CREMERS (1987), but more reduced, because one branch of each sympodial ramification is mostly suppressed [in addition often one of the two proximal partial-inflorescences is aborted, or the main axis of the inflorescence ends at the first node; in this cases the whole inflorescence appears only 2-branched]; inflorescence axes loosely covered with stellate hairs of "type b"; flowers (fig. 3A; measurements from boiled material): length (without pedicel) 4 mm; pedicels 1 mm long, covered with small, few-branched stellate hairs; inferior ovary ca. 1 mm long, with small hairs of "type a" and small, few-branched, stellate hairs of "type b"; hypanthium ca. 0.4 mm long, with scattered hairs of "type a" and few stellate hairs; calyx ca. 1 mm long, with only few hairs of "type a", apically with 5, small, elongated appendages (fig. 3A), splitting into ca. 3, tooth-like or irregular parts (appendages staying together), shed at anthesis or shortly afterwards (some parts still persist on fruits); petals (fig. 3B) ovate, narrowed in a long tip, ca. 2.4 mm long and 1 mm broad, their margins fimbriate-erose; stamens 5, episealous; filaments ca. 0.6 mm long, ca. 0.5 mm broad, flat; anthers round to slightly oblong, ca. 1 mm long (without connective-appendage) and 0.7 - 1 mm broad, opening with apical pores; basal connective-appendages triangular to nearly cone-shaped, ca. 0.7 mm long, before anthesis pointing upwards (because of the reflexed anthers), at anthesis pointing downwards to the ovary; styles 3 mm long, with scattered hairs of "type a" especially on lower half, and only a very slightly enlarged stigmatic zone; fruits: 2 mm long and 3 mm wide, with a small limb (remnant of hypanthium) surrounding the upper half, 3-locular (sometimes apparently 4-locular: some old, open fruits are showing 4 placentae!), apically opening with three small, loculicidal slits, later splitting irregularly; old, irregularly splitted capsules (fig. 3C) long persistent; placentae 3 (- 4), axile, located approximately in the middle of locules, strongly intrusive, perpendicular to flower axis, 0.6 - 0.7 mm long, apically spatulate, their stipex 0.1 - 0.2 mm broad; diaspores consisting of a nearly triangular, light brown, hollow structure, which is flattened on the two broader faces, in sicco ca. 0.4 - 0.7 mm long, 0.3 - 0.5 mm broad and ca. 0.15 mm thick; single seed oblong, placed on one of the two small sides of the triangular diaspore; the second small triangle-side of the diaspore formed by a hollow appendage, which is open towards the large triangle-side; margin of the opening erose; (description of indumentum, flowers and fruits based mainly on Hammel et al. 15947).

The branches of the type collection were growing most probably in a vertical position, therefore the leaves are crowded and apparently, spirally arranged on branch apices. The branches of the other two collections, however, were obviously exposed horizontally,

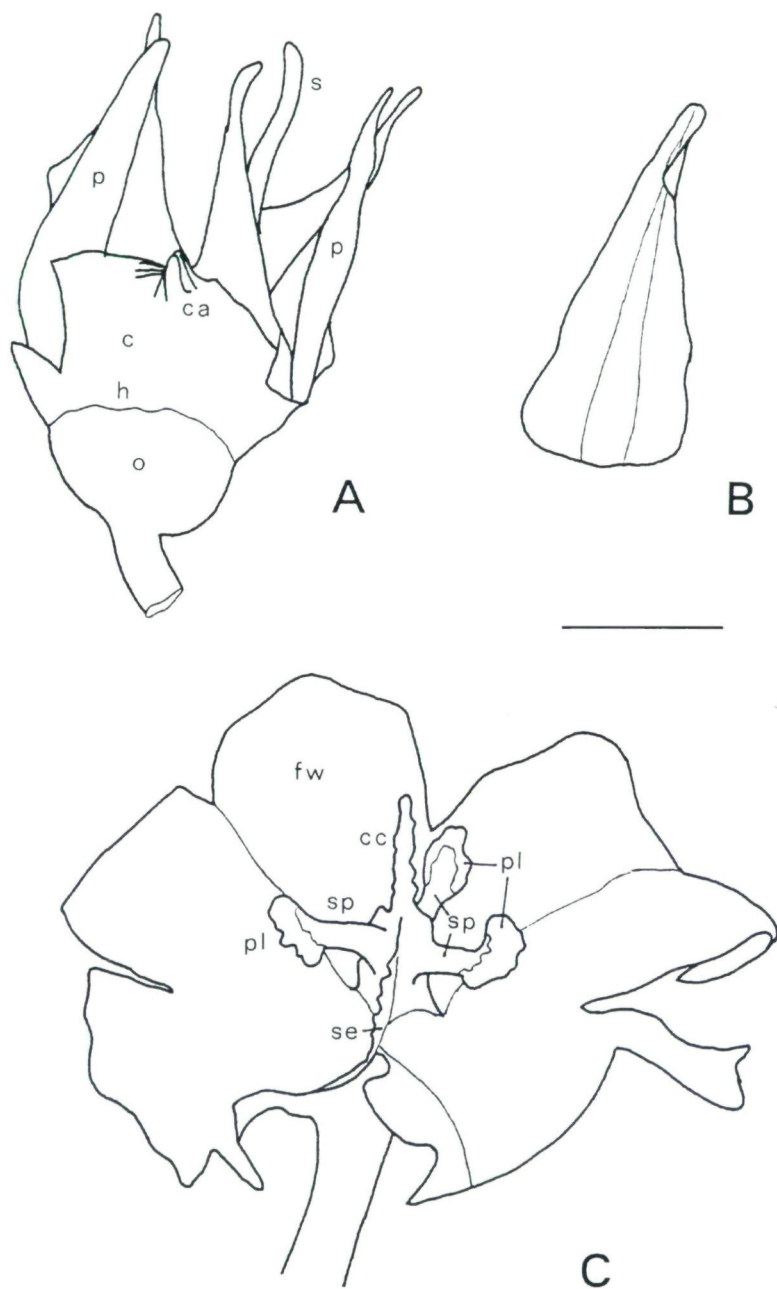


Fig. 3: *Alloneuron ulei* (from Hammel et al. 15947). A: flower shortly before anthesis (c, calyx; ca, calyx appendages; h, hypanthium; o, ovary; p, petals; s, style); B: petal; C: old, ruptured capsule (cc, central column; fw, remnants of fruit wall; pl, placentae; se, remnants of septa; sp, stalks of placentae); (Bar = 1 mm).

with distichous leaves and longer internodes. The specimens of Hammel & al. 15947 are showing very broad leaves (up to 6 cm), long internodes (up to 3.5 cm) and extraordinary long petioles (up to 2 cm), features which are indicating most probably a shady growth place.

The growth form of *A. ulei* is characterized by an irregular alternation of shoot modules conforming to "Chamberlain's" and respectively "Leeuwenberg's model" (models described in HALLÉ et al. 1978). The latter model differs from the first mentioned one (which is fully discussed under *A. majus*): "... in the production of more than one relay axis below the inflorescence ... All relay axes are equivalent and subsequently repeat the construction of the parent axis." The result is an obviously branched (polycaulous) plant. *A. ulei* grows most of the time according to "Chamberlain's model", but from time to time single shoot modules conforming to "Leeuwenberg's model" are intermixed. This way the plant can produce equivalent branches and take advantage of every free space around it. This is especially important for plants growing on vertical rocks and developing horizontally exposed branches. HALLÉ et al. (1978) are not reporting any plant species which growth form shows an alternating mixture of this two growth models.

Collections studied:

Colombia: Comisaría del Caquetá, Florencia, Quebrada de las Perdices, matorrales entre peñas, 400 m, (fl + fr), 23. Mar. 1940, J. Cuatrecasas 8847 [COL n.v., F, US], annotations on the label: "Hierba o sufrútex, rupestre higrófila, corolla blanca, anteras amarillas". - Putumayo, Mocoa, east of town towards Rio Afan and on west slope of Alto de Afan, ca. 3 km east of town, 1°10' N, 76°42' W, 700 m, (fl + fr), 11. Dec. 1986, B. Hammel, B. Ramirez & J. Trainer 15947 [COL, MO, U, US, W; in total 9 duplicates collected, to be distributed from MO]; annotations on the label: "Shrublet under overhang of vertical rock face along small stream in forest; leaves glossy above, dull below; flowers white; common in spots".

Section *Meiandra* (MARKGR.) B.WALLN., comb. et stat.n.

≡ *Meiandra* MARKGR., Notizbl. Bot. Gart. Berlin-Dahlem 9: 1142 (1927).

Diagnosis: A sectione typica differt: folia magna (usque ad c. 33 cm longa et c. 11 cm lata); flores et fructus dense agglomerati.

Type species: *Alloneuron majus* (MARKGR.) MARKGR. ex J.F.MACBR.

Alloneuron majus (MARKGR.) MARKGR. ex J.F.MACBR., Trop. Woods 17: 13 (1929); (fig. 4).

≡ *Meiandra maior* MARKGR., Notizbl. Bot. Gart. Berlin-Dahlem 9: 1142 (1927); (figures of habit and details on page 1143!)

Type: Peru, Ost-Peru, Stromgebiet des Marañon von Iquitos aufwärts bis zur Santiago-Mündung am Pongo de Manseriche, flutfreier Hochwald, ca. 77°30' W, [160 m], (fl + fr?), 24. Nov. 1924, G. Tessmann 4625 [holotype: B, destroyed, photo 17395 ex F at MO; isotype: NY specimen n.v., microfiche 716/B1 (cf. HOLMGREN et al. 1985)]; annotations on the label: "Kelch hellgrün; Blumenbl[ätter] weiss, hellgrün übertaucht; Staubbeutel hellgrün; Staubbeutel gelb mit brauner Seite; Stämmchen 30 cm hoch, unverzweigt" (= perianth white, tinged light green; pollen sacks light green; pollen sacks yellow, with a brown face; small trunk 30 cm high, unbranched).

Concerning the growth form of this species, the literature is contradictory. The protologue of *Meiandra maior* indicated the growth form as "truncus 30 m [sic!] altus, non [!] ramificatus". The simultaneously published protologue of genus *Meiandra*, however, described both species as "arbusculae" (MARKGRAF 1927). MACBRIDE (1929, 1941) and

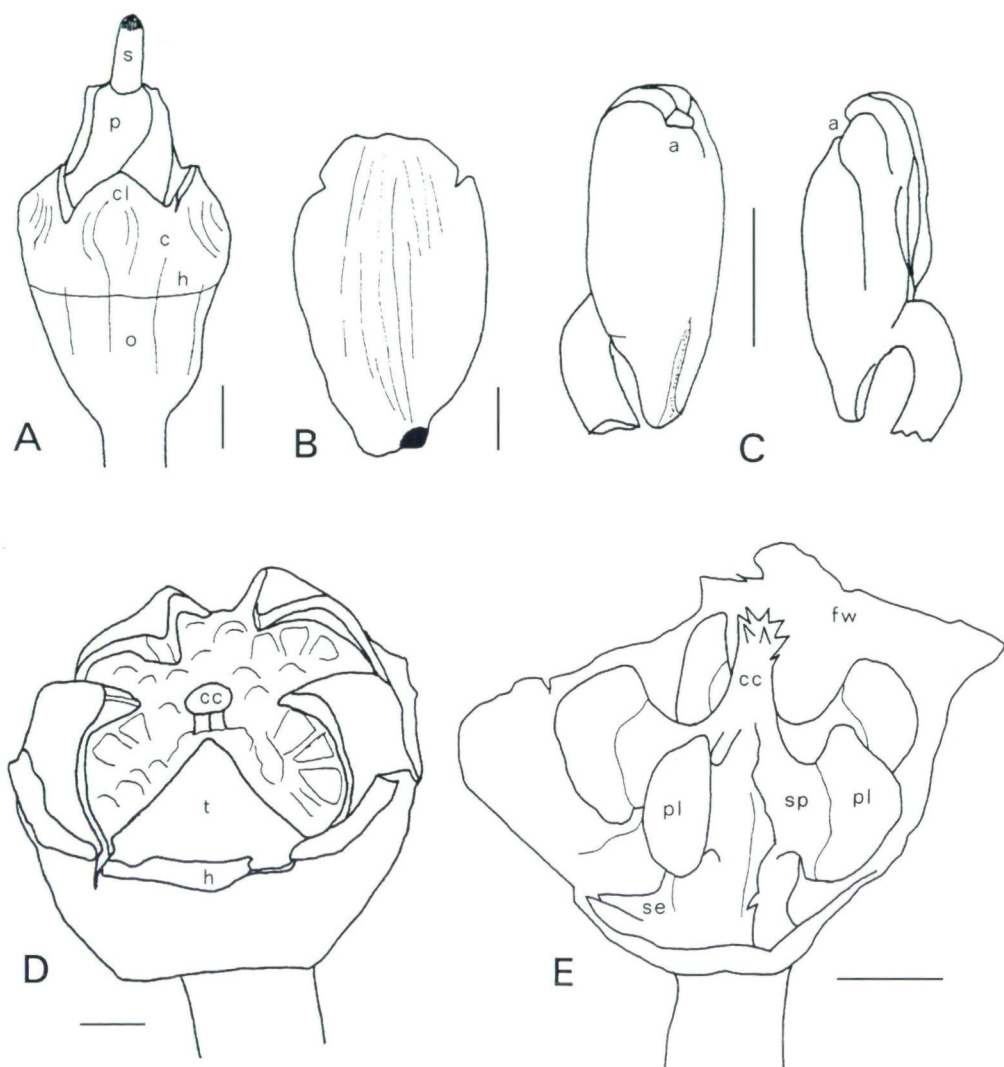


Fig. 4: *Alloneuron majus* (from alcohol material of Wallnöfer 12-19388). A: flower bud, shortly before anthesis (c, calyx; cl, calyx lobes; h, hypanthium; o, ovary; p, contorted petals; s, exserted style); B: petal; C: anther and filament (a, aperture); D: open capsule (cc, upper part of central column; h, remnants of hypanthium; t, teeth); E: old, ruptured capsule (cc, central column; fw, remnants of fruit wall; pl, placentae; se, remnants of septa; sp, stalks of placentae); (Bar = 1 mm).

WURDACK (1971) perpetuated this erroneous information for *A. majus* (= *M. maior*). BRAKO & ZARUCCHI (1993) classified this species as "endemic shrub". However, the partially printed and partially handwritten (barely legible!) original label of the holotype (see Field Museum-photo 17395) states in German: "Stämmchen 30 cm [!] hoch, unverzweigt" (= small stem 30 cm high, unbranched).

I had the opportunity to study this species in the Sira mountains (Dept. Huánuco) of Peru over an extended period. According to my observations, *A. majus* is a sympodial growing, but monocaulous and unbranched treelet, reaching a height of 0.5 - 1 m. All shoot-modules (branch-units) are orthotropic, originating only from one of the two uppermost, opposite leaf axils (at the base of the long pedunculate, terminal inflorescence) of the preceding module and again ending in a terminal inflorescence. The infructescences are therefore pseudo-lateral. This growth form corresponds to "Chamberlain's model" (HALLÉ & al. 1978), which is defined as: "monocaulous, polyaxial, vegetative axes all equivalent and orthotropic". It seems not to have been reported for any species of Melastomataceae. This architectural tree model can often be observed on plants of the rain forest understorey. These plants subsist on only small quantities of light and, therefore, due to only restricted energy resources, cannot produce both vegetative and fertile organs at the same time. However, one of the four specimens of the collection (Vasquez & al. 18500) shows a regular, simple ramified shoot: from both axils at the base of one inflorescence equivalent shoots were developed. This seems to be a rare exception.

Further field observations: basal part of stem ascending with some thicker, spreading, supporting-roots, without stolons; each individual with 3 - 6 adult, opposite leaves at the same time, crowded at the top of the brown stem; hairs on leaves light brown and spreading; each plant developing only one, green, long pedunculate inflorescence at the same time; lateral partial-inflorescences with a short stalk and with only one sympodial ramification near bases, showing a terminal flower and two simple branches, which are contracted and curled downwards, forming dense cincinni, each one with two rows of unilateral flowers; flowers constantly 5-merous (rarely 4-merous); ovaries, hypanthia and calyces light green; calyces (fig. 4A) splitting into (3 -) 5, more or less regular lobes, shed at anthesis; petals (fig. 4B) white, right-contorted, 4.3 - 5 x 2.6 - 3.2 mm, broadly lanceolate to slightly obovate, their apex truncate (sometimes with a small mucro in the middle of the apex), at base contracted, glabrous, with a fimbriate-erose margin, reflexed during anthesis (in the morning), and appressed to the ovary, later spreading and shed on same day; filaments whitish-light brown, flat, distally curved hook-like (fig. 4C), at anthesis inclined towards the style, together forming a cone-shaped, interrupted structure; anthers (fig. 4C) inflexed in bud, at anthesis erect, yellow, afterwards brown, leaning on the style with their broad sides; proximal connective-appendages single, nearly cone-shaped pointing upwards in bud, but downwards (in the abaxial direction) at anthesis; styles white, soon exerted between the still contracted petals of the older flower buds (fig. 4A; proterogyny?), at anthesis exceeding the stamens by ca. 3 mm; stigmata green, punctiform; anthesis of flowers within inflorescences centrifugal and lasting for ca. 1 month per inflorescence; only very few flowers per inflorescence (mostly only one per ramification) reaching anthesis each day; later on each inflorescence-ramification carries in their proximal part nearly ripe fruits and distally still flower buds; flowering observed from March until May; fruits (fig. 4D) 5-locular (rarely 4-locular), opening with 5 (open 4-locular capsules have not been observed), regular, \pm erect slightly spreading teeth; immature fruits light green, with whitish-light green receptacles; open capsules brown, erect, exposing the numerous, small seeds (dispersed by wind? or rain drops?), in vivo 6 mm wide and equally high; old capsules (fig. 4E) irregularly ruptured and long persistent; plants growing in shady places along creeks in small valleys.

Collections studied:

Peru: Dept. Amazonas, Prov. Condorcanqui, Distrito el Cenepa: región nororiental del Marañón, Rio Cenepa, comunidad Tutino, bosque primario, 04°33' S, 78°10' W, 450 m, (fl + fr), 22. Nov. 1993, R. Vasquez, C. Diaz, J. Mostacero, F. Mejia & J. Ampam 18500 [MO, W, 2 more duplicates will be distributed from MO], annotations on the label: "hierba 0,40 m, flores blancas". - Dept. Huánuco, Prov. Pachitea, western slope of the Sira mountains ca. 20 - 24 km SE Puerto Inca: small valley near the top of the ridge between Rio Lullapichis and Rio Negro, near "Campamento Sira", 9°28' S, 74°47' W, upper montane forest, 800 m, (fl + fr), 19. Mar. 1988, B. Wallnöfer 12-19388 [LZ, US, USM, W]; - same locality, in stream bed at ca. 860 m, (fr), 7. Jul. 1969, F. Wolfe 12265 [NA 2x]. - Dept. Pasco, Prov. Oxapampa: Valle del Palcazu, Iscozacín: camino a Villa America, low tertiary hills on valley floor, 400 m, (fr), 8. Aug. 1981, R. B. Foster 4627 [F, MO], annotations on the label: "pole shrub, 1 m, fruit dry"; - same locality, trail to Villa America 4 km from airstrip, 10°12' S, 75°15' W, 400 m, (fl + fr), 12. Jan. 1984, R.B. Foster, M. Chanco & J. Alban 7918 [F], annotations on the label: "shrub 1 m, on steep stream banks, flowers white, hanging down, overlapping petals enclosing base of protruding white style with pink tip, young fruit pale green".

***Alloneuron liron* B.WALLN., sp.n.** (fig. 5 and 6)

Diagnosis: Ab *Alloneuron majore* recedit: inflorescentia (infructescentia) ad basin ramosa; rami longi primarii totius inflorescentiae pilis stellatis et simplicibus longis patentibus vestiti; folia subtus nervi secundariis tertiariisque pilis stellatis et simplicibus patentibus obsita.

Type: Peru, Departamento of Amazonas, Rio Cenepa, Monte al lado de Cenepa, (fl + fr), 25. Jan. 1973, R. Kayap 248 [holotype: MO, nr. 04979135, photo at W; isotype: MO, nr. 3409855, xerocopy at W]; annotations on the label: "Shrub 1 m tall, leaves yellow (5/5), flowers white."

Woody, apparently unbranched treelet ("shrub") 1 m tall; growth form not clearly discernible from the incomplete specimens, but probably corresponding to "Chamberlain's model" as described by HALLÉ & al. (1978), [details discussed under *A. majus*]; stem: terete, on distal part densely covered with 3 - 10 mm long, light brown to brown bristles of "type e" and smaller hairs of "type c.3"; internodes not clearly visible, because of the dense indumentum and the crowded leaf bases; petioles: ca. 0.5 cm long, hidden among the long, light brown to brown hairs of "type c.3" and the long bristles of "type e"; leaves: crowded on stem apices, opposite, chartaceous, pinnately veined (mixed craspedodromous; secondary veins \pm curved, sometimes straight, 1 - 2.5 cm distant from each other), leaf lamina oblanceolate, symmetrical, gradually long-attenuate towards base, mature leaves 20 - 33 x 6 - 11 cm, widest at upper 1/3 of the lamina; apices acuminate; bases auriculate, subamplexicaul; margins especially on distal half sinuate-denticulate; leaves with trichomes of "type a - c": the smallest ones of "type a" scattered on both surfaces; the stellate hairs of "type b" scattered on adaxial leaf surfaces and more densely along midvein, where they are crowded towards leaf bases; on abaxial leaf surfaces these hairs ("type b") crowded along the main vein, especially towards the base; on secondary to tertiary veins they are more scattered (more dense on younger leaves); the long hairs of "type c" mostly 1 - 3 mm long, in sicco light brown and regularly distributed on lamina and veins on adaxial leaf surfaces and 1 - 2 mm distant from each other; the longer hairs of "type c" mostly possessing an apex of "type c.1", the shorter ones mostly showing an apex of "type c.2" or rarely one of "type c.3"; on abaxial leaf surfaces these hairs ("type c") scattered along the smallest veins (never on veinless parts of lamina), mostly showing the apex of "type c.2", rarely that of "type c.3"; these hairs markedly

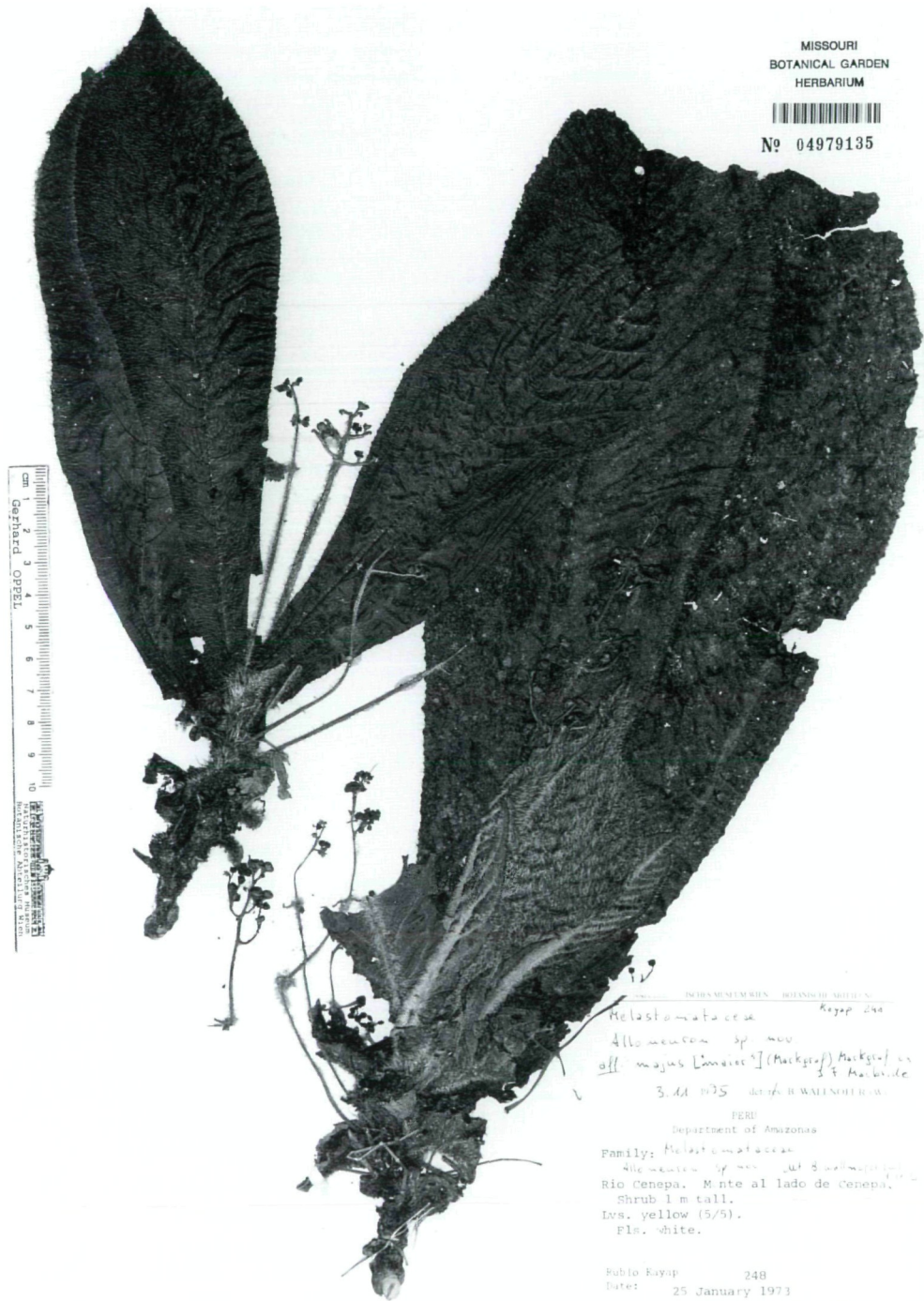


Fig. 5: *Alloneuron liron*, holotype [MO].

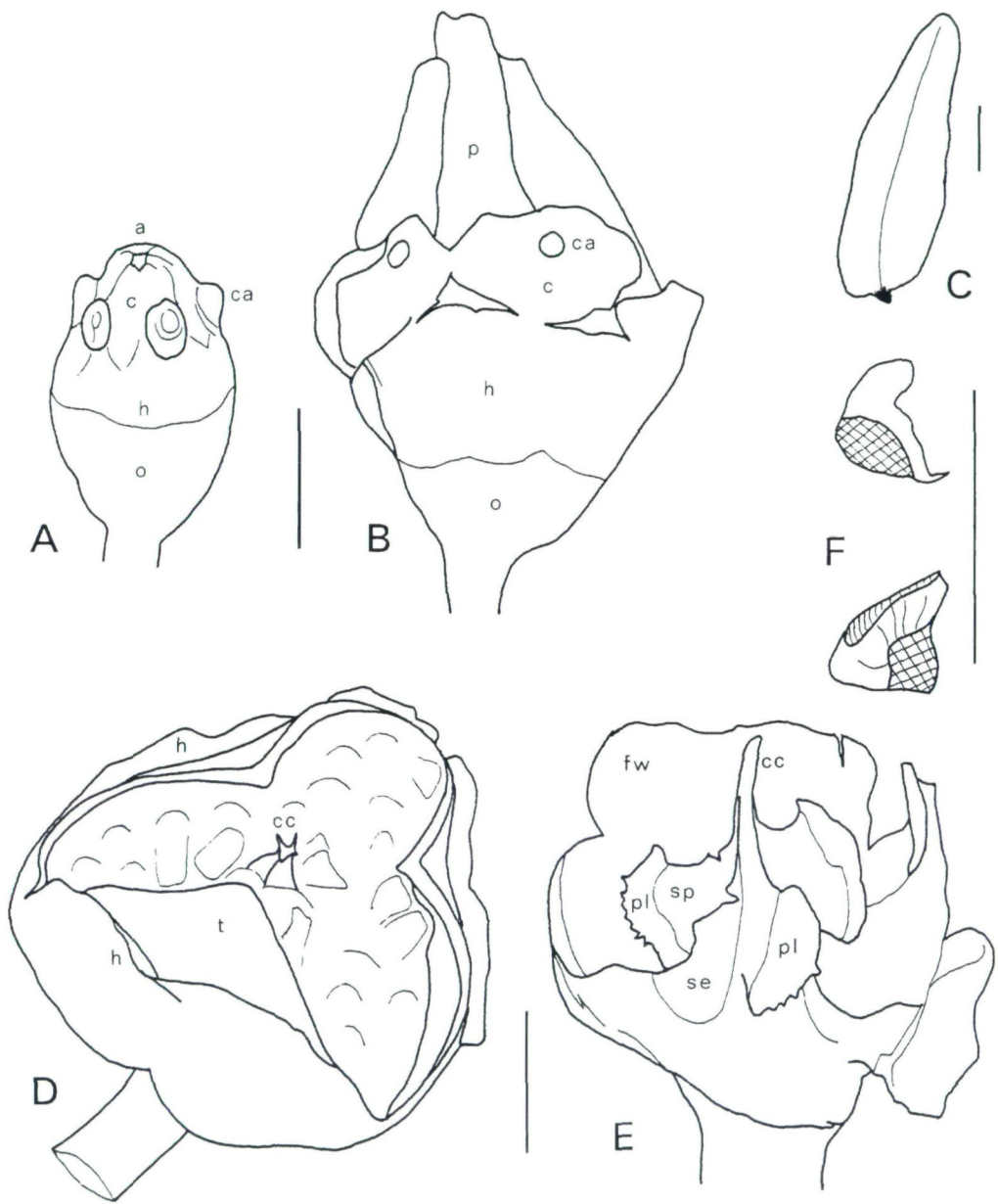


Fig. 6: *Alloneuron liron* (from type-collection). A: flower bud (a, aperture; c, calyx; ca, calyx appendages; h, hypanthium; o, ovary); B: flower shortly before anthesis (c, calyx shortly before shed; ca, calyx appendages; h, hypanthium; o, ovary; p, petals); C: petal; D: open capsule (cc, upper part of central column; h, remnants of hypanthium; t, teeth); E: old, ruptured capsule (cc, central column; fw, remnants of fruit wall; pl, placentae; se, remnants of septa; sp, stalks of placentae); F: diaspores (hatched part containing the single seed); (Bar = 1 mm).

concentrated along primary and secondary veins, mostly showing an apex of "type c.3", rarely one of "type c.2", and densely covering the proximal part of the main vein; young leaves in sicco on both surfaces more densely covered with yellowish-light brown hairs of "type c"; leaf margins quite densely covered with 0.8 - 3.5 (- 4) mm long hairs of "type c.1", rarely of "type c.2"; inflorescences apparently terminal, during fructification, however, apparently pseudolateral [their bases not clearly visible, because of the crowded leaf bases and the dense indumentum; see annotation about growth form under *A. majus*], 10 - 15 cm long, 2 - 4 cm wide, 5 - 7 cm long stalked, simple or often composed from base of several, long stalked partial-inflorescences (some of these still arising, when the other ones bear ripe fruits; - further studies on fresh material are necessary to unravel the inflorescence type); stalks densely covered with small, stellate hairs of "type b" and long, patent hairs of "type c.3"; branches of partial-inflorescences 1 - 2.5 cm long, the lower ones 1 - 1.5 cm distant from each other, the upper ones crowded; flowers (fig. 6A - B): crowded towards apices of inflorescence-branches, secund; flowers reaching anthesis continuously from proximal parts of inflorescences to distal parts (apparently only one per inflorescence branch and day); flower length (without pedicel) 6 - 7 mm (measurements from boiled material!); pedicels ca. 1 mm long, thin, densely covered with hairs of the "type b", becoming 1.5 mm long, ca. 0.8 mm thick and glabrescent on fruits; inferior ovary 1 - 1.5 mm long, obconical, covered with hairs of "type a and b" (on some ovaries one of these hair-types is predominant); hypanthium 1 - 1.5 mm long, cup-shaped, outside more loosely covered with hairs of "type a and b", with the latter less frequent; distal border of hypanthium truncate (after loss of calyx) or with tooth-like 0.3 - 0.5 mm long structures, the sinus between them mostly wide and only slightly curved towards proximal parts; calyx in bud apically open, older ones 1 - 1.5 mm long, cup-shaped or slightly campanulate, with $5 \pm$ irregular teeth, which bear near apex 5 dorsal, small appendages (fig. 6A - B), outside nearly glabrous and only with a few hairs of "type a" (rarely of "type b"), before or at anthesis more or less irregularly splitting towards the base and shed in 5 (?) parts (fig. 6B); petals (fig. 6C) right-contorted, ovate and gradually narrowed into a tip, 4 - 4.5 mm long, 1.5 - 1.8 mm wide, widest at 1/3 of the length, glabrous, fimbriate-erose on margins; inner floral organs and receptacle glabrous; stamens 5, episepalous; filaments 1 mm long and 0.3 mm wide, flat; anthers 2 mm long and 1 mm wide, opening with apical pores; basal connective-appendages 1 mm long, triangular to nearly cone-shaped, before anthesis pointing upwards (because of the reflexed anthers), at anthesis pointing downwards to the ovary; styles 5 mm long, only slightly tapering from base; stigma small, slightly capitate; fruits: many-seeded, dry capsules (fig. 6D), ca. 3 mm long and 3 - 4 mm wide, with a small limb (remnant of hypanthium) surrounding the upper half, 3-locular or rarely apparently 2-locular, apically opening with three, loculicidal slits (open 2-locular capsules have not been observed); old, irregularly splitted capsules (fig. 6E) long persistent; placentae 3, axile, located approximately in the middle of locules, strongly intrusive, perpendicular to flower axis, 0.8 mm long, distally enlarged, stipex 1 mm broad; diaspores (fig. 6F) consisting of a light brown, hollow, \pm triangular structure, flattened on the two broader faces, in sicco ca. 0.4 - 0.6 mm long, 0.2 - 0.3 mm broad and 0.2 mm thick; single seed oblong, placed on one of the two small sides of the triangular diaspore; the second small triangle-side formed by a hollow appendage, open to the large triangle-side of diaspore; margin of opening erose.

Epithet: The species is dedicated to Ron Liesner (MO), a botanist, today rare, with a wide-ranging knowledge of phanerogams. While attempting to identify my own collection during my last stay at MO, he kindly made the above mentioned specimens (still undetermined at family-level) available to me for study and determination. The epithet is a compound formed of his name.

***Wurdastom* B.WALLN., gen.n.**

Diagnosis: Differt ab *Alloneuron* PILG. foliis 5 - 7 (- 9)-nervatis acrodromis, i. e. habitu typico Melastomatacearum.

Type species: *Wurdastom dudleyi* (WURDACK) B.WALLN.

Shrubs or trees up to 5 (- 8) m; leaf venation acrodromous, 5 - 7 (- 9)-plinerved; stellate and "stipitate-stellulate" (= "type c.3", see chapter about indumentum) hairs absent; flowers 4 - 9-merous, haplostemonous; capsules developing from inferior ovaries.

This new genus is proposed to encompass all species of *Alloneuron* described by WURDACK (1971, 1974, 1981, 1990). All are characterised by acrodromous leaves (with 3- to several palmate or subpalmate primary veins) and their typical Melastomataceae-appearance. In MO I saw many other sheets annotated by Wurdack as *Alloneuron* sp., with the same characters. All these specimens clearly do not belong to *Alloneuron* as circumscribed by PILGER (1905). The features of haplostemony, inferior ovaries and dry capsules have very probably evolved independently in several groups within the family. The leaf venation pattern and the different type of indumentum are the important features for segregation of the new genus.

Epithet: The genus is dedicated to John J. Wurdack (US), for long an investigator of neotropical Melastomataceae. The name is a compound formed of his name and of the plant family.

The following new combinations are necessary:

***Wurdastom bullata* (WURDACK) B.WALLN., comb.n.**

Basionym: *Alloneuron bullatum* WURDACK, Phytologia 21: 362 - 363 (1971).

***Wurdastom cuatrecasasii* (WURDACK) B.WALLN., comb.n.**

Basionym: *Alloneuron cuatrecasasii* WURDACK, Phytologia 21: 362 (1971).

***Wurdastom dorrii* (WURDACK) B.WALLN., comb.n.**

Basionym: *Alloneuron dorrii* WURDACK, Phytologia 69: 323 - 324 (1990).

***Wurdastom dudleyi* (WURDACK) B.WALLN., comb.n.**

Basionym: *Alloneuron dudleyi* WURDACK, Phytologia 21: 363 - 364 (1971).

***Wurdastom ecuadorensis* (WURDACK) B.WALLN., comb.n.**

Basionym: *Alloneuron ecuadorensis* WURDACK, Phytologia 48: 246 - 247 (1981)

***Wurdastom hexamera* (WURDACK) B.WALLN., comb.n.**

Basionym: *Alloneuron hexamerum* WURDACK, Phytologia 29: 148 - 149 (1974).

***Wurdastom sneidernii* (WURDACK) B.WALLN., comb.n.**

Basionym: *Alloneuron sneidernii* WURDACK, Phytologia 29: 149 (1974).

***Wurdastom subglabra* (WURDACK) B.WALLN., comb.n.**

Basionym: *Alloneuron subglabrum* WURDACK, Phytologia 21: 364 - 365 (1971).

Acknowledgements

I wish to thank Ron Liesner and Barry E. Hammel (both MO) for making some collections available for this study, and James C. Solomon (curator at MO) for lending this material to Wien. I thank Heimo Rainer (WU), Friedrich Lauria and Ernst Vitek (both W) for critically reading the manuscript. Thanks are also due to Manfred A. Fischer (WU) and Harald Riedl (W) for correcting the Latin diagnoses, and to Gerhard Oppel (W) for the photographs.

References

- BRAGO, L., ZARUCCHI, J.L. 1993: Catalogue of the flowering plants and gymnosperms of Peru. Catálogo de las Angiospermas y Gimnospermas del Perú. – Monogr. Syst. Bot. Missouri Bot. Gard. 45: 1286 pp.
- GLEASON, H.A. 1929: Studies on the flora of northern South America - XII. – Bull. Torrey Bot. Club 56: 97 - 112.
- HALLÉ, F., OLDEMAN, R.A.A., TOMLINSON, P.B. 1978: Tropical trees and forests. – Berlin, Heidelberg, New York: Springer Verlag.
- HICKEY, L.J. 1979: A revised classification of the architecture of dicotyledonous leaves. – In: METCALFE, C.R., CHALK, L. (eds): Anatomy of the Dicotyledons, ed. 2., Vol. 1: 25 - 39. – Oxford: Clarendon Press.
- HOLMGREN, P.K. et al. 1985: Index to specimens filed in the New York Botanical Garden vascular plant type herbarium. – Westport, London: Meckler Publ.
- MABBERLEY, D.J. 1987: The plant-book. – Cambridge: University Press.
- MACBRIDE, J.F. 1929: A new Miconia and other large Melastomes of Peru. – Trop. Woods 17: 12 - 14.
- MACBRIDE, J.F. 1941: Melastomataceae. – In: MACBRIDE, J.F. (ed.): Flora of Peru. – Publ. Field Mus. Nat. Hist., Bot. Ser. 13/4: 566 pp.
- MARKGRAF, F. 1927: Melastomataceae. – In: MILDBRAED, J. (ed.): Plantae Tessmannianae peruvianae IV. – Notizbl. Bot. Gart. Berlin-Dahlem 9: 1139 - 1148.
- MENTINK, H., BAAS, P. 1992: Leaf anatomy of the Melastomataceae, Memecylaceae and Crypteroniaceae. – Blumea 37: 189 - 225.
- PILGER, R. 1905: Melastomataceae. In: PILGER, R. (ed.): Beiträge zur Flora der Hylaea nach den Sammlungen von E. Ule. – Verh. Bot. Ver. Prov. Brandenburg 47: 165 - 186.
- RENNER, S.S. 1993: Phylogeny and classification of the Melastomataceae and Memecylaceae. – Nordic J. Bot. 13: 519 - 540.
- SELL, Y., CREMERS, G. 1987: Les inflorescences des Melastomataceae guyanaises, leur filiation et leur valeur taxonomique. – Canad. J. Bot. 65: 999 - 1010.
- WELLE, B.J.H. TER, KOEK-NOORMAN, J. 1981: Wood anatomy of the neotropical Melastomataceae. – Blumea 27: 335 - 394.
- WIELGORSKAYA, T. 1995: Dictionary of generic names of seed plants. – New York: Columbia University Press.
- WURDACK, J.J. 1971: Certamen Melastomataceis XVII. – Phytologia 21: 353 - 368.
- WURDACK, J.J. 1974: Certamen Melastomataceis XXIII. – Phytologia 29: 135 - 151.
- WURDACK, J.J. 1980: 138. Melastomataceae. In: HARLING, G., SPARRE, B. (eds): Flora of Ecuador 13: 406 pp.
- WURDACK, J.J. 1981: Certamen Melastomataceis XXXII. – Phytologia 48: 238 - 252.
- WURDACK, J.J. 1986: Atlas of hairs for neotropical Melastomataceae. – Smithsonian Contr. Bot. 63: 80 pp.
- WURDACK, J.J. 1990: Certamen Melastomataceis XXXIX. – Phytologia 69: 316 - 327.