

NEW SPECIES AND COMBINATIONS IN LASIANTHAEA
(ASTERACEAE, HELIANTHEAE)

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ABSTRACT

The generic limits of Lasianthaea are expanded with the description of several new species, and the transfer of yet others from the ill-defined genus Zexmenia La Llave and the recently proposed Lundellianthus, which is a monotypic genus based upon L. petenensis H. Rob. The latter is shown to be a synonym of Zexmenia guatemalensis Donn.-Sm.

Attempts to provide treatments of the difficult genera Lasianthaea, Otopappus, Zexmenia and Wedelia for our upcoming Asteraceae of Mexico (Turner & Nesom, in prep.) has necessitated description of the following new species and new combinations. These tasks have been made easier by the recent treatments of Lasianthaea (Becker, 1979), Otopappus (Hartman and Stuessy, 1983) and the careful rendition of these two genera by McVaugh (1984) in his monumental Flora Novo-Galiciana. The unpublished manuscript by Rindos (1980) has also proved quite helpful.

In spite of the several references mentioned above, the generic lines between these several genera are drawn with considerable difficulty. This is reflected by H. Robinson's recent description of the monotypic Lundellianthus, which is a synonym of Zexmenia guatemalensis, which Becker (1979) retained in Zexmenia. Indeed, were Lundellianthus guatemalensis the only species to be accommodated within Robinson's segregate genus I might accept his treatment as perhaps valid, or at least as good as any, but with the transfer of Otopappus jaliscensis McVaugh into Lasianthaea by Hartman and Stuessy and the admittance of Zexmenia rosei Greenm. into Lasianthaea by McVaugh (1984) and especially by the detection of L. belizeana and L. breedlovei, as described herein, it seems clear that Lundellianthus can not stand as monotypic, or neatly demarcated from Lasianthaea. Of course Lundellianthus might be expanded to include L. belizeana, L. breedlovei, L. kingii, L. salvinii and perhaps other species, but these are so inextricably linked to Lasianthaea, especially the group of shrubs

centering about L. fruticosa L. that I see little point in segregating them. Indeed, they appear to be as readily incorporated into Lasianthaea as are the tuberous-rooted herbs to which Becker (1979) even deigned sectional status. But it must be admitted that an expanded Lasianthaea, as envisioned here, still presents generic problems, as it is still perhaps too close to Zexmenia for "phyletic comfort."

Robinson (1978, 1979) has retained the closely related genus Oyedaea as distinct from Zexmenia. The former is typified by Oyedaea verbesinoides DC. of Costa Rica, Panama and southwards. This species has neuter ray florets, but its fruit and floral characters are like those of Zexmenia. Robinson (1979) describes the achenes of Z. verbesinoides as "not constricted at the apex". I would describe the achenes as broadly constricted at the apex. At least the awns and scales arise from a definite bulge which, at maturity, sit within the enlarged flattened indurate margins. This is the state of the pappus in most species of Zexmenia (e.g. Z. serrata, the generotype). Indeed, species of both Oyedaea and Zexmenia occasionally possess elaisomes on the achenes, as do several species of Wedelia (Nesom, 1981). In any case I find little to distinguish between Zexmenia and Oyedaea except for the sterile ray florets. Even Blake (1921), who revised Oyedaea, commented that Oyedaea is closely related to Zexmenia but "it is readily if somewhat artificially distinguished by its neutral rays." He goes on to describe the achenes of Oyedaea verbesinoides as having pappus "Squamellae about 8 to 12, linear-lanceolate, acuminate, lacerate-fimbriate, united below into a cup, 0.8 to 2 mm long." The cup or corona (a term used in his description for the genus as a whole) is presumable found in all or most of the species, along with narrow, or not-so-narrow, marginal wings. Blake's description of the achenes of Oyedaea would apply, equally well, to most species of Zexmenia. We are left then, with but neuter florets to distinguish between the reputed genera, a notoriously inconstant character that varies among species of a given genus (e.g., commonly so in Verbesina) and within a species or even a variety (e.g., Machaeranthera pinnatifida; Turner, 1987). Robinson (1979) implied that Oyedaea may yet be naturally circumscribed and "that none of the species north of Costa Rica are true Oyedaea [i.e., not including the type species, O. verbesinoides], but alternatives to the artificial concept are provided for only two Mexican species [Oyedaea mexicana Rzed., which he correctly transferred to Otopappus (also accepted by Hartman &

Stuessy, 1983) and *Oyedaea ovalifolia* A. Gray, which he used for his monotypic *Perymeniopsis* H. Rob. (1978), which I position within an expanded *Perymenium* (Turner, 1988)]. The two Guatemalan species are retained in *Oyedaea* awaiting more natural limits for the entire complex of genera." No doubt better resolution is needed, but in my opinion the type species of *Oyedaea* belongs to *Zexmenia*.

I have defined these several genera by a combination of floral and achenal characters that I think reflects natural lineages. These are best summarized in key-fashion, as follows.

1. All of the following hold for *Lasianthaea*: Corollas with tubular or near-tubular (i.e., very narrowly funnelliform) throats, the vascular-lines well-defined, the lobes short and usually well-endowed with short thick hairs; style branches slender with penicillate appendages, rarely apiculate; ray and disk achenes truncate, the lateral awns 2 or 3 between which occur 1 to several short scales, there is no noticeable neck to the achene body and the awns are seemingly extensions of the achenal margins; the disk achenes are usually unwinged and somewhat 3-4 sided at maturity but the ray achenes often possess well-developed wings.
1. One or more of the following hold for *Otopappus*, *Wedelia* and *Zexmenia* (including *Oyedaea*): Corollas somewhat funnelliform to nearly tubular, the vascular lines usually weakly defined, the lobes various; style branches often broad with short apiculate, sparsely hispid, appendages; disk achenes with necks from which arise the awns and scales; if the body is truncate then the margins usually provided with well-developed wings on the adaxial side only, these extending up and onto the awn.

LASIANTHAEA BECKERI B. Turner, sp. nov. Fig. 1.

L. rosei (Greenm.) McVaugh similis sed flosculis radiatis et disci luteis, involucris 4-5 seriatis aequaliter et gradatim imbricatis, et squamis pappi liberis 2.5-3.5 mm longis differt.

Perennial herbs 50-60 cm high. Stems slender, spreading-strigose, arising from well-developed tubers, the internodes mostly longer than the leaves. Leaves only 4-5 pairs per stem, somewhat elliptical to obovate,

7-10 cm long, 1.5-4.0 cm wide; petioles 0.1-1.0 cm long, often winged throughout; blades penninervate, or weakly trinervate from above the base, striqose on both surfaces, the margins irregularly serrulate. Heads 4-5, borne on elongate stalks 15-20 cm long, the heads nearly sessile in much-reduced leafy bracts. Involucre 4-5 seriate, narrowly campanulate, 9-10 mm long; bracts broadly ovate, decidely graduate, 2-10 mm long, strongly ciliate, mostly obtuse with dark green apices. Pales lanceolate, 3-lobed, shorter than the subtended florets. Ray florets 5, pistillate, fertile; corollas yellow, the tubes ca 3 mm long, the ligules 6-7 mm long, ca 3 mm wide. Disk florets 20-30; corollas yellow, narrowly funnelliform, 6-7 mm wide; tube ca 1 mm long, glabrous; throat 5-6 mm long with strongly developed vascular strands, glabrous for most of its length, the lobes ca 0.5 mm long, ciliate. Anthers black. Style branches slender with narrow, penicillate, appendages. Ray achenes (immature) 3-sided, winged, the pappus of 3 awns, extending from the margins. Disk achenes (immature), with the body ca 3 mm long, obviously winged, flat; pappus of 2-3, rigid, linear, ciliate awns, 2.5-3.5 mm long, arising from the margins.

TYPE: MEXICO. JALISCO: ca 5.3 mi N Tecalitlan along highway 110, reportedly growing in secondary scrub-growths along roadside; uncommon, 17 Aug 1971; Warren D. Stephens 1432a (holotype, TEX; isotype MSC, 2 sheets).

In Becker's (1979) treatment of Lasianthaea the above specimen will key (except for its yellow ray and disk florets) to L. zinnioides (Hemsl.) Becker. The latter is superficially similar in habit (perennial herbs with 3-5 pairs of leaves to each stem) but very different in leaf shape (strongly 3-nervate and nearly sessile) and vestiture (short-hispidulous throughout).

In McVaugh's (1984) treatment of Lasianthaea the specimen will not key, but if the florets were "dark purplish red" it would key somewhere near L. zinnioides and L. rosei. The latter taxon, as noted by McVaugh, was inexplicably retained in Zexmenia by Becker, although it appears to have all of the characters of Lasianthaea. In fact, I conclude that L. beckeri is most closely related to L. rosei, possessing the habit, leaves and vestiture of that species, but differs in its yellow ray and disk florets, more evenly gradate involucre, fewer ray florets and longer, ununited, pappus scales. In any case, neither Becker or McVaugh appears to have examined material of L. beckeri; at least type material is not

cited in their treatments.

It is a pleasure to name this species for Dr. Kenneth Becker, whose monograph of *Lasianthaea* has helped to clarify specific and generic relationships among the zexmeniid elements of Mexico and Central America.

LASIANTHAEA BELIZEANA B. Turner, sp. nov.

L. guatemalensis (Hemsl.) B. Turner similis sed petiolo no perfoliatis non alatis, capitulis cylindricis flosculis paucioribus differt.

Weak-stemmed shrub to 3 m high. Leaves opposite throughout, mostly 8-16 cm long, 1.5-3.0 cm wide; petioles 0.6-1.6 cm long; blades linear-lanceolate, 3-nervate from somewhat above the base, strigillose beneath with closely appressed hairs, the margins entire to remotely denticulate, tapered into attenuated apices. Stems, at maturity, terete, strigose. Heads cylindrical, radiate, 2-10, arranged in terminal or subterminal clusters, the ultimate peduncles mostly 3-10 mm long. Involucres cylindrical, 10-12 mm long, 3-5 mm wide, the bracts 2-3 seriate, subequal, the outermost 2-3 in number, lanceolate to oblanceolate, strigose, the apices somewhat herbaceous; inner bracts somewhat chartaceous, like the pales. Receptacle convex, the pales acute, shorter than the subtended florets. Ray florets 3-5, the ligules 3-5 mm long, yellow, with apices weakly notched, if at all. Disk florets 6-10, the corollas yellow, 5-6 mm long, the throat cylindrical, with well-developed vascular-lines and 5, coarsely hispid, lobes ca 0.7 mm long. Anthers black, the appendages dark and spade-like. Style branches slender with penicillate appendages. Ray achenes with body ca 5 mm long, tangentially flattened, the margins winged and extending onto the 2 awns; pappus of 2 stout awns, 3-4 mm long, between these ca 6 pairs of separate scales, 0.1-2.5 mm long. Disk achenes (immature) 4-sided but presumably radially compressed, 4-5 mm long, the pappus of 4-8 oblique scales, 0.1-2.5 mm long.

TYPE: BELIZE: Gracie Rock, 1.5-4.0 mi S of Mile 22 on Western Highway, 100 m, 21 Jan 1974, R. Leisner & J. Dwyer 1475 (holotype LL; isotype MO; strother, pers. comm., also notes specimens at BM, MO, UC).

This taxon is quite distinctive, standing somewhere between *Lasianthaea salvinii* and *L. breedlovei*, possessing ray achenes with pronounced wings, and disk

florets, albeit immature, with 4 sides. The corollas and style branches are like those of Lasianthaea, but one might make a case for the treatment of these several species in an expanded Lundellianthus such as will soon be proposed by Strother (pers. comm.; ms). I prefer to place them in an expanded Lasianthaea where they relate to L. fruticosa and allies.

LASIANTHAEA BREEDLOVEI B. Turner, sp. nov., Fig. 2.

L. salvinii (Hemsl.) B. Turner similis sed foliis minoribus grosse hispidis in paginis infernis, capitulis minoribus flosculis paucioribus, et flosculis disci aristis pappi valde asymmetricis differt.

Suffrutescent shrublet or shrub. Stems at maturity, terete, brownish, minutely strigose. Leaves opposite, 5-8 cm long, 1.5-3.0 cm wide; petioles 3-10 mm long; blades ovate, pubescent above with erect, stiff, broad-based, hairs, strigillose below, the margins remotely serrulate to nearly entire, the apices acute. Heads 1-3, terminal or axillary on peduncles 0.5-3.0 cm long. Involucres 2-3 seriate, campanulate, 0.8-1.5 cm high; the outer series ovate to oblanceolate, 8-15 mm high, strigillose; the middle series ovate, ca 8 mm long; the inner series ovate, ca 4 mm long. Pales somewhat chartaceous, linear, ca 6 mm long, acute to trifid. Ray florets 8, pistillate, fertile; corollas yellow, tube ca 3 mm long, the ligules bifid, ca 8 mm long, ca 3 mm wide. Disk florets ca 50; corollas yellow; tube slender, ca 1.5 mm long; throat narrowly funnelform, ca 4 mm long, glabrous for most its length, the lobes ca 0.6 long, hispid. Anthers black, with black and white ovate appendages. Style branches slender with subulate, hispidulous, appendages. Ray achenes 3-sided, the body winged along the sides and extended into 2-3 scales, the latter 0.5-3.0 mm long. Disk achenes 4-sided, unwinged, glabrous, 3-4 mm long, surmounted by an oblique pappus of 3-7 rigid scales, 0.1-4.0 mm long, the inner-most longer than the others.

TYPE: MEXICO. CHIAPAS: 10 km SW Ocosingo along road to San Cristobal, steep slope with Pinus and Quercus, 1200 m, 23 Sep 1972, D.E. Breedlove 27848 (holotype TEX; isotype CAS).

Lasianthaea breedlovei is noteworthy for the somewhat 4-sided unwinged disk achenes which are surmounted by an oblique set of stiff scales, the longest of which extends from the margins. Except for the

wingless margins, the achenes are surprisingly like those of Otopappus jaliscensis McVaugh, which Hartman and Stuessy (1983), in my opinion, correctly transferred to Lasianthaea; indeed, the overall aspect of L. breedlovei resembles that of L. jaliscensis but the latter is readily distinguished by its larger heads with larger florets. The style branches, florets, ray achenes and position of pappus of both species suggest a closer relationship with Lasianthaea than to Otopappus.

Lasianthaea breedlovei also possesses attributes of L. guatemalensis which, as noted below, H. Robinson recently elevated to a monotypic genus, Lundellianthus, albeit in ignorance of the fact that it had been described earlier as a species of Zexmenia. Indeed, were it not for Lasianthaea breedlovei, which in its corolla and stylar features serves as a link between Lasianthaea and Lundellianthus, the latter might stand as a good genus. Lasianthaea breedlovei has the 4-sided disk achenes of L. salvinii and a strongly winged ray achene, reminiscent of that species.

LASIANTHAEA CALVA (Greenm.) B. Turner, comb. nov. .

Based upon Perymenium (?) calvum Greenm., Proc. Amer. Acad. Arts 40:41. 1904.

Damnaxanthodium calvum (Greenm.) Strother, Syst. Bot. 12:41-43. 1987.

Strother (1987), in erecting the monotypic genus Damnaxanthodium, compared this herbaceous perennial with the habitually similar Lasianthaea aurea (D. Don) K. Becker, Perymenium buphthalmoides DC. and Wedelia mexicana (Sch.-Bip.) McVaugh. He notes that it does not compare favorably with either Perymenium or Wedelia but thought it exhibited "a novel suite of traits involving organs of perennation and details of capitulescence, flowers and fruits." Actually, compared to L. aurea, as listed in Strother's Table 1, it appears to differ significantly only in its non-tuberous roots and epappose, wingless achenes. However, Damnaxanthodium, compared to Lasianthaea (sensu Becker, 1979) would differ only by its epappose, somewhat 4-sided, wingless achenes and the only difference between Damnaxanthodium and Lasianthaea (sensu B. Turner) is that of pappus. In short, I believe that Perymenium (?) calvum is an epappose species of Lasianthaea. Because of its herbaceous habit and subequal involucre bracts I would relate it to L. palmeri (W.W. Jones) Becker, from which

it differs primarily by its wingless, epappose, more turgid, achenes.

LASIANTHAEA GUATEMALENSIS (J.D. Smith) B. Turner, comb. nov.

Based upon Zexmenia guatemalensis J.D. Smith, Bot. Gaz. 13:188.1888.

Ludellianthus petenensis H. Rob., Wrightia 6:41.1978.

Robinson, apparently unaware of the earlier name, Zexmenia guatemalensis, has redescribed this taxon as the only species of a newly described genus, Ludellianthus, as noted above. Becker recognized an isotype of L. petanensis (LL!, 1975, by annotation) as Zexmenia guatemalensis and the material concerned readily keys to the latter species in his treatment of Zexmenia for the flora of Guatemala and there is little doubt that these belong to the same species.

While Zexmenia guatemalensis was kept distinct from Lasianthaea by Becker (1976), it seems more closely related to that group than it does to Zexmenia proper, especially considering the recent inclusion of such taxa as Lasianthaea rosei, L. jaliscensis, and L. breedlovei, discussed above. At least I can see no justification for the erection of Ludellianthus, the generotype possessing nothing unique. Robinson emphasized the unwinged (and presumably 4-sided) disk achenes as being different from that of Lasianthaea and Zexmenia, but Jones (1905) emphasized these very characters in his recognition of Z. guatemalensis.

LASIANTHAEA KINGII (H. Rob.) B. Turner, comb. nov.--

Based upon Zexmenia kingii H. Rob., Phytologia 41:34.1978.

Lasianthaea kingii has the corolla and achenal characters of Lasianthaea. The mature disk achenes are winged in the manner of that genus and the awns appear to be marginal extensions of the body; the scales are united into a small crown which superficially resembles a neck. Further, the anthers are yellow with appendages like Lasianthaea. It does differ from most species of the latter genus in having relatively broad stylar branches with apiculate appendages. Overall it appears to stand somewhere between the Lasianthaea fruticosa group and the

L. guatemalensis group.

LASIANTHAEA SALVINII (Hemsl.) B. Turner, comb. nov.--

Based upon Zexmenia salvinii Hemsl., Biol. Centr. Amer. Bot. 2:173.1881.

Robinson, in his description of Zexmenia kingii, comments upon the similarity of the latter to Z. salvinii, a view with which I concur. Both possess similar achenes, and the peripheral achenes tend to disarticulate at maturity as a unit with the adjacent pales, a feature also occurring in the herbaceous, tuberous-rooted, Lasianthaea rosei (Greenm.) McVaugh. The stylar appendages of L. salvinii, however, are not noticeably apiculate and the anther appendages are purplish and spade-like.

LASIANTHAEA STEYERMARKII (Blake) B. Turner, comb. nov.

Based upon Oyedaea steyermarkii Blake, Proc. Biol. Soc. Wash. 60:42.1947.

LASIANTHAEA LUNDELLII (H. Rob.) B. Turner, comb. nov.

Based upon Oyedaea lundellii H. Rob., Wrightia 6:45. 1979.

This is superficially similar to the above species.

The type (Guatemala: La Cumbre, Cerro la Cueva, 22 Mar 1977, Lundell & Contreras 20642; holotype US, isotype LL!) occurs in the general vicinity of, and presumably with, L. lundellii, as may be ascertained from the several sheets of L. steyermarkii cited by Robinson (1979) from La Cumbre, Guatemala. This taxon differs from L. steyermarkii by a number of features including its longer peduncles, more foliaceous outer involucre bracts, and harsher pubescence. Indeed, Strother (pers. comm.) considers it sufficiently distinct from all of the taxa discussed here so as to be placed (possibly!) in a monotypic genus.

ACKNOWLEDGEMENTS

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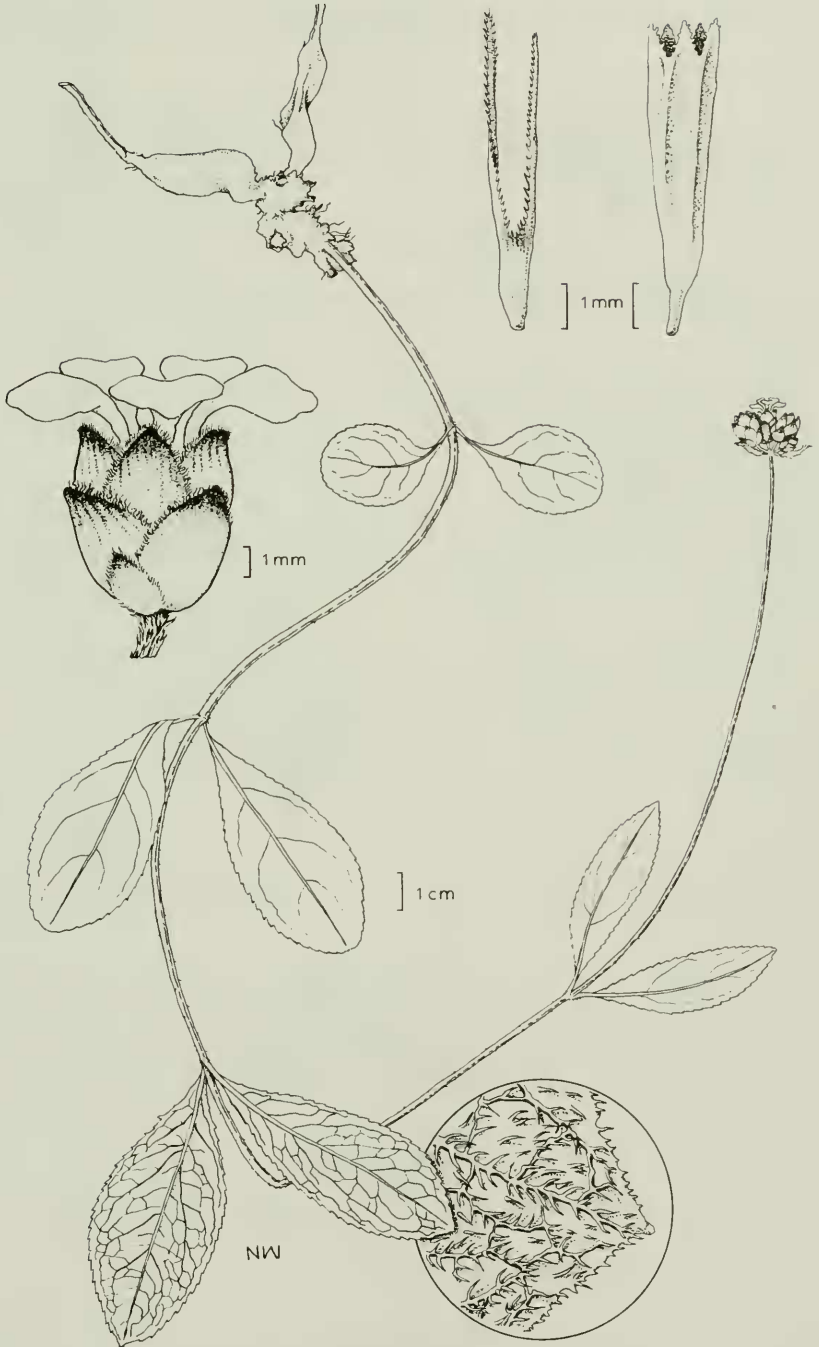


Fig 1. LASIANTHAEA BECKERI, from holotype

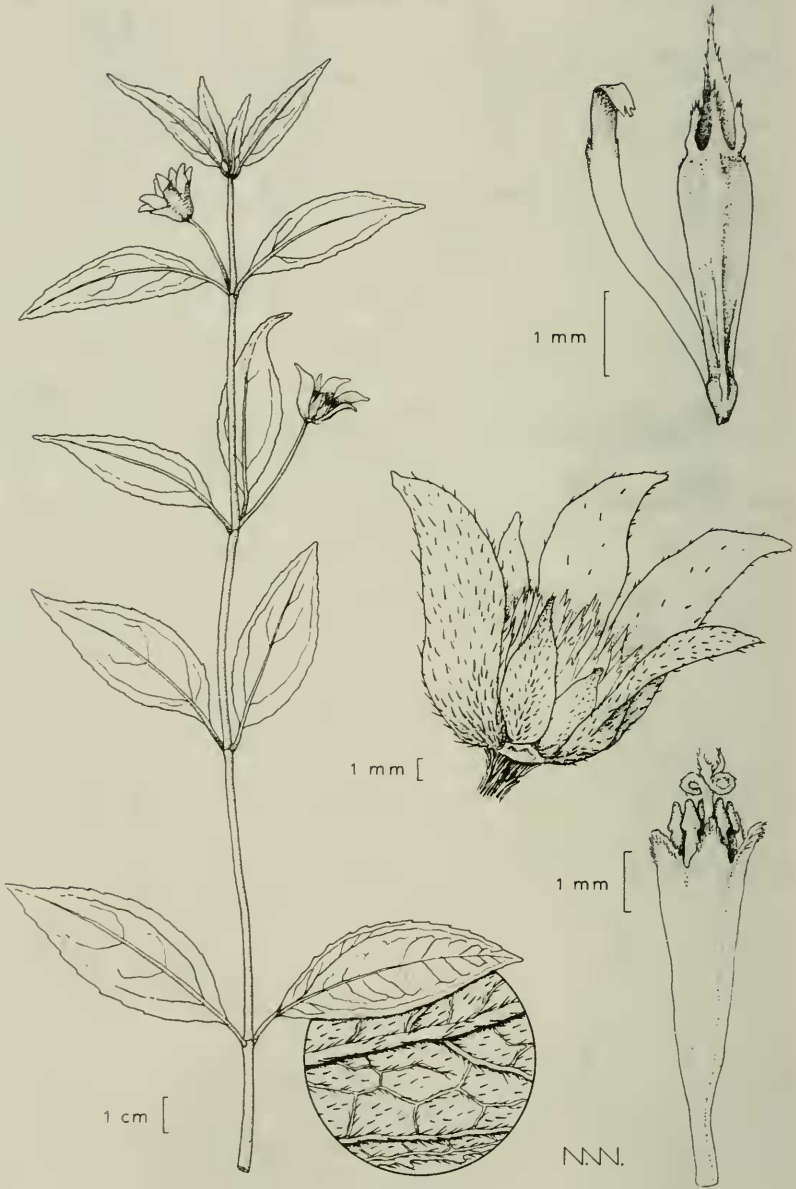


Fig 2 LASIANTHAEA BREEDLOVEI, from holotype