

STUDIES IN THE HELIANTHEAE (ASTERACEAE).  
XXXIV. REDELIMITATION OF THE  
GENUS *ANGELPHYTUM*

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*Abstract.*—The genus *Angelphytum* Barroso of eastern South America, originally monotypic, is expanded to include a total of 14 species. The character of eradiate heads originally used to delimit the genus proved unreliable, occurring also in species of *Zexmenia*, *Wedelia*, and *Aspilia*. As redefined, *Angelphytum* includes species related to *Dimerostemma* but having fertile liguliform or disciform peripheral flowers in the heads. Three new species, *A. bahiense*, *A. hatschbachii*, and *A. reitzii* are described, ten new combinations are made, and a key is provided.

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The present effort continues a series of studies attempting to resolve and in some cases describe the numerous members of the *Wedelia* relationship of the subtribe Ecliptinae in Brazil. The related group includes many species, often xylopodial, in the open or crystalline habitats of eastern Brazil. It remains one of the most poorly resolved elements of the family Asteraceae in the area. The papers of the present series have sometimes retained the artificial traditional generic concepts such as *Wedelia* and *Aspilia* (Robinson 1984a, b), but in cases such as the recent treatment of *Dimerostemma* (Robinson 1984c), an apparently logical and natural generic limit has been attained. Again, in the present study of *Angelphytum*, logical and workable natural limits are established. The studies of both *Angelphytum* and *Dimerostemma* show the expected result of proving that many species of the Ecliptinae in Brazil previously assigned to widely distributed genera actually belong to local Brazilian genera.

*Angelphytum* was originally described by Barroso (1980) to honor the Argentine botanist Angel L. Cabrera. The genus included a single species from Mato Grosso, Brazil. It was compared with *Zexmenia* and *Dimerostemma* because of the winged margins of the achenes, but was separated by the lack of rays in the flowering heads. As indicated by Barroso, the heads had differentiated peripheral flowers with triquetrous achenes, but their corollas are disciform and bisexual rather than liguliform. In comparison, *Dimerostemma* has rays which are totally asexual, while *Zexmenia* has ray flowers with functional female structures. *Angelphytum* was not originally directly compared with either *Wedelia* or *Aspilia*, but the latter two differ traditionally from the genera mentioned by Barroso by having a strong constriction at the top of the achene below the pappus and by the essential lack of wings on the achene.

At the time of the original description of *Angelphytum*, there was no reason to doubt seriously the naturalness of the monotypic genus or the value of its distinguishing character. Only *Zexmenia foliosa* Rusby in Jones of Bolivia, a plant of very different habit, had at that time been described in the related group of genera with the same type of peripheral flowers in the head. Still, the form of the peripheral flowers of the head in the Heliantheae, and especially in the Ecliptinae, is evidently

of sporadic occurrence (Robinson 1981), and is beginning to come under suspicion as an a priori generic character. It seems rather fortuitous that in the last few years two additional previously undescribed South American members of the Ecliptinae that also lack radiate corollas have been sent for identification. As in the case of *Zexmenia foliosa*, these species are not congeneric with the type-species of *Angelphytum*. The first of the new species, from Mato Grosso, Brazil, has precisely the same floral arrangement as the type of *Angelphytum*, but the achenes, including the triquetrous peripheral achenes, lack wings and are constricted apically under the pappus. Also, the corollas, even though disciform, have funnelliform throats rather than cylindrical throats with slightly campanulate bases as in *Angelphytum*. The new Mato Grosso species has shown additional characters relating it to members of the genus *Wedelia* that are common in the area, and the species has been named *Wedelia hatschbachii* (Robinson, 1984a). The second new eradiate Ecliptine species, collected in Ecuador, differs significantly from the first in the apparent lack of triquetrous peripheral achenes of the type found in *Angelphytum*. In this case the eradiate condition seems to derive from a complete lack of any flowers outside of the normal disk flowers. The Ecuadorian plant also differs in having black anther appendages and strong fiber sheaths along the veins of the corolla throats, characters that are very rare in *Wedelia* and quite common in *Aspilia*. This latter set of characters seems useful in spite of evidence of some artificiality in the separation of *Wedelia* and *Aspilia*. The combination of the characters in the Ecuadorian plant has been interpreted as evidence of relationship to *Aspilia*, a genus in which the rays are usually present but sterile, and the species has been named *Aspilia pastazensis* (Robinson, 1984b). The existence of *Zexmenia foliosa* of Bolivia, and the discovery of the two new species belonging to *Wedelia* and *Aspilia*, all lacking rays, in addition to the original doubts about the value of the character, furnish convincing evidence that the genus *Angelphytum* as originally described is untenable.

The discovery of the untenability of *Angelphytum* as originally described would be unwelcome except for the fact that the name thus becomes available for a much broader natural element that would otherwise be without a name. The additional species transferred here to *Angelphytum* have fertile rays and have previously been placed in *Zexmenia*. As in the case of *Wedelia hatschbachii*, the bisexual peripheral flowers with triquetrous achenes in the type-species of *Angelphytum* seem to relate to the fertile-rayed condition. The species transferred here to *Angelphytum* are not considered to have any direct relationship to *Zexmenia* which is typified by the Mexican and Central American *Z. serrata* Llave. As indicated in the unpublished thesis of Rindos (1980) on relationships within *Zexmenia*, some subgroups, including the type, have apically constricted achenes and are closely related to if not congeneric with *Wedelia*. Other comparatively distinct elements recognized in *Zexmenia* by Rindos prove to belong to *Lasianthaea* (Becker, 1979), *Lundellianthus* (Robinson, 1978), or in one case, immediately related to *Otopappus* from which it differs only by the lack of the primary technical character (Anderson *et al.* 1979). From all these latter elements the present concept of *Angelphytum* is distinct by being xylopodial herbs rather than shrubs, by having cylindrical rather than funnelliform upper throats on the disk corollas, by having inflated collars on the anthers, and by having generally con-

torted or coiled abaxially glanduliferous rather than gradually curving non-glanduliferous branches on the disk styles. The species of *Angelphytum* do not have the strong fiber sheaths on the veins of the disk corolla throats seen in *Lasiantha* DC., the intricately interconnected paleae seen in *Lundellianthus* H. Robinson, or a viny habit and wings of the mature achene extending without significant interruption to the tips of the pappus awns as seen in *Otopappus* Benth.

Most Brazilian species that have previously been placed in *Zexmenia* prove to belong to *Angelphytum* in a manner similar to the way Brazilian species once placed in the Andean genus *Oyedaea* DC. have proven to belong to *Dimerostemma*. Nevertheless, a few species in the area that have been placed in *Zexmenia*, such as *Z. foliosa* of Bolivia, *Z. rudis* Baker of Brazil, *Z. apensis* (Chod.) Hassl. of Paraguay and adjacent Brazil, and two species closely related to the latter, *Z. goyazensis* (Gardn.) Benth. and Hook. and *Wedelia goyazensis* Gardn. of Brazil, are shrubby species without xylopodia, with more funnellform throats on the disk corollas, mostly with partially to completely blackened appendages on the anthers, and with less curved branches on the disk styles. The members of the *Z. apensis* group show glands abaxially on the style branches and evenly distributed papillae on the inner surfaces of the corolla lobes as in *Angelphytum*, but they are further distinct in the more pilosulous outer surfaces of the disk corolla lobes. Evidence indicates that the above species are not particularly close to *Angelphytum*, and they are probably best retained under the somewhat narrowed umbrella concept of *Zexmenia*. One species from northern Argentina, *Wedelia brachylepis* Griseb., that has recently been transferred to *Zexmenia* seems best returned to *Wedelia* on the basis of habit and floret structure.

The actual closest relationship of *Angelphytum* seems to be with *Dimerostemma*. The latter has a similar herbaceous habit with a xylopodium in most species, has similarly shaped disk corollas with cylindrical upper throats, scarcely to non-setuliferous outer lobe surfaces, and evenly papillose inner lobe surfaces, has similarly enlarged anther collars, has similarly contorted usually abaxially glanduliferous branches of the disk styles, and has similar usually broadly winged disk achenes. In fact, the principal distinction of *Angelphytum*, the fertile rather than sterile peripheral or ray flowers, would not alone be evidence that the division between the genera was natural. The characteristic well differentiated outer series of involucre bracts in *Dimerostemma* compared to the undifferentiated or irregularly differentiated outer bracts in *Angelphytum*, however, seems to confirm the phyletic value of the distinction based in the fertile peripheral flowers.

One other group of species in the area of Brazil has some of the characters of *Angelphytum* and may prove related. These are the many xylopodial perennial *Wedelia* species of the planalto that are quite unlike the shrubby non-xylopodial typical members of that genus in the wetter parts of tropical America. Nevertheless, these Brazilian species have the achenes with constricted coroniform apices and have fertile ray flowers as in typical *Wedelia*, and for that reason they continue to be placed in that genus. In addition to having xylopodia, these species resemble *Angelphytum* in the shape of their disk corollas and in often having distinctly thickened anther collars. Still, none of the species have style branches of the disk flowers as curved as those of *Angelphytum*, and the branches are non-glanduliferous abaxially. Also, the corolla lobes often have prominent hairs on the outer

surface and vary in both overall shape and pattern of internal papillosity. The detailed floral characters seem to support fully the naturalness of the generic distinction from *Angelphytum* based on the form of the achenes. The planalto species do seem to be linked by intermediate forms with some of the typical types of *Wedelia* such as *W. hookeriana* Gardn. or *W. alagoensis* Baker that are found in eastern Brazil.

*Angelphytum* G. M. Barroso, Bolet. Soc. Argent. Bot. 19 (1-2):7-11. 1980.

Perennial herbs with few to many erect, scarcely to moderately branched stems from a xylopodium. Leaves alternate to opposite, linear and sessile to ovate on distinct petioles, uni- to trinervate. Inflorescence with 1-many heads; peduncles elongate. Heads broadly campanulate with many flowers; involucre without or with an irregularly distinct outer series of bracts. Peripheral flowers of heads ca. 10-14, fertile, forming trigonous achenes, usually bearing rays, bearing bisexual disciform corollas in the type species. Disk corollas ca. 25-70, with a short glabrous basal tube weakly demarcated at the top from the slightly campanulate base of the throat; upper throat cylindrical and mostly glabrous, without obvious fiber sheaths on the veins; lobes ovate-triangular, with glands and few or no setulae externally, with low uniform papillae covering the entire inner surface; anther collars distinctly thickened and abruptly constricted at the top; anther appendages with glands on the outer surface; style branches strongly curved or contorted, with glands abaxially. Achenes not constricted above under the pappus, with broad wings or lobes on the margin not continuing uninterrupted to the tips of well developed awns; awns usually stout and tapering, triquetrous, sometimes lacking, squamellae variably present.

*Type-species.*—*Angelphytum matogrossense* G. M. Barroso.

#### Key to the species of *Angelphytum*

1. Leaves mostly or completely alternate, sometimes opposite near the base 2
  2. Heads without rays, with peripheral flowers bearing bisexual disciform corollas ..... *A. matogrossense*
  2. Heads with distinct rays ..... 3
    3. Heads with herbaceous outer involucre bracts sometimes exceeding the height of the flowers; lower leaves often opposite ..... *A. arnottii*
    3. Heads with firm involucre bracts of uniform or graduated lengths, not exceeding the height of flowers; leaves spirally inserted throughout ..... 4
      4. Leaves elliptical ..... *A. myrtifolium*
      4. Leaves linear ..... 5
        5. Leaves with recurved margins; outer involucre bracts shorter than the inner and with more rounded tips; achenes without squamellae filling the gap between the awns; heads rounded on the lower surface ..... *A. reitzii*
        5. Leaves with firm flattened margins; outer involucre bracts not shorter than the inner; achenes with squamellae filling the

- gap between the awns; heads with mostly tapering sides . . .  
 . . . . . *A. hatschbachii*
1. Leaves mostly or completely opposite . . . . . 6
  6. Leaves sessile or tapering to the base; petiole indistinct, 1 mm or less long . . . . . 7
  7. Leaves linear; involucre bracts subequal in length . . . *A. oppositifolium*
  7. Leaves elliptical to oblong; outer involucre bracts foliose, often longer than the inner bracts . . . . . 8
  8. Leaf blades narrowly acute and attenuate at the base . . . *A. hieronymi*
  8. Leaf blades broadly acute at the base . . . . . *A. paraquariense*
  6. Leaves with distinct petiole 4 mm or more long . . . . . 9
  9. Achenes with awns  $\frac{1}{3}$  or less the length of the body; wings interrupted or lobate . . . . . 10
  10. Leaf blades lanceolate, gradually narrowed at the base . . . . .  
 . . . . . *A. indutum*
  10. Blades of larger leaves ovate, rather abruptly narrowed at the base . . . . . 11
  11. Tips of involucre bracts reflexed; achenes with short but distinct awns . . . . . *A. bahiense*
  11. Tips of involucre bracts not reflexed, erect; achenes without distinct awns . . . . . *A. tenuifolium*
  9. Achenes with awns mostly  $\frac{1}{2}$  or more as long as the body; wings broad, uninterrupted . . . . . 12
  12. Leaves short-acute to obtuse; achenes incompletely squamellose between the awns; outer involucre bracts not longer than the inner . . . . . *A. grisebachii*
  12. Leaves narrowly acute; achenes completely squamellose between the awns; outer involucre bracts often longer than the inner . . . . . 13
  13. Leaves with numerous, smaller, more erect hairs on the lower surface between major veins, lower surface sparsely and minutely glanduliferous . . . . . *A. pseudosilphioides*
  13. Leaves without more numerous, smaller, more erect hairs on the lower surface, with numerous glandular punctations . . . . . *A. aspilioides*

The genus *Angelphytum* as presently recognized contains the following 14 species.

*Angelphytum arnottii* (Baker) H. Robinson, comb. nov.

*Verbesina arnottii* Baker in Martius, Fl. brasil. 6(3):215. 1884. *Zexmenia arnottii* (Baker) Hassler, Fedde Repert. 14:264. 1916. Northern Argentina, Brazil: Mato Grosso, Paraná, Paraguay.

*Angelphytum aspilioides* (Grisebach) H. Robinson, comb. nov.

*Verbesina aspilioides* Grisebach, Abh. Königl. Ges. Wiss. Göttingen 24:194. 1879. *Zexmenia aspilioides* (Griseb.) Hassler, Fedde Repert. 14:158. 1915. Argentina, Paraguay.

*Angelphytum bahiense* H. Robinson, sp. nov.

Plantae herbaceae perennes ad 1.5 m altae mediocriter ramosae; xylopodium non visum. Caules pallide rubescentes subteretes leniter striati minute strigulosi et sparse glandulo-punctati. Folia opposita, petiolis distinctis 4–15 mm longis; laminae ovatae plerumque 3.5–7.0 cm longae et 1.2–3.4 cm latae base late obtusae abrupte anguste decurrentiter acuminatae fere ad basem trinervatae margine multo serrulatae apice acutae supra dense minute scabridae sparse glandulo-punctatae subtus in nervis primariis et secundariis albidae et dense strigulosae cetera pallide virides dense subvelutine pilosulae et dense glandulo-punctatae. Inflorescentiae in ramis terminales 1–3-capitatae, pedunculis plerumque 2.5–8.0 cm longis. Capitula late campanulata ca. 7–9 mm alta; squamae involucri exteriores ca. 12–14 herbaceae vel distaliter herbaceae oblongae vel anguste ellipticae 7–17 mm longae et 2–5 mm latae apice recurvatae in partibus herbaceis foliiformes in partibus basilaribus pallide subscariosae dense scabridae et sparse glandulo-punctatae; bractae interiores et paleae pallide scariosae oblongo-lanceolatae ca. 7 mm longae et 2 mm latae margine puberulo-fimbriatae superne irregulariter paucis dentatae et minute serrulatae apice breviter acutae vel minute apiculatae extus superne ad medio multo glandulo-punctatae. Flores radii ca. 10 in capitulo; corollae flavae, tubis angustis ca. 1.5 mm longis pilosulis, limbis anguste oblongis ca. 10 mm longis et ca. 3 mm latis extus pilosulis et dense glandulo-punctatis. Flores disci ca. 30 in capitulo; corollae flavae tenues 4.0–4.5 mm longae, tubis ca. 1 mm longis glabris, faucibus cylindraceutis base campanulatis ca. 2.7–3.0 mm longis inferne glabris superne paucis glanduliferis et in nervis setuliferis, lobis ovato-triangularibus ca. 0.7 mm longis et 0.6 mm latis extus glanduliferis intus praeter basem extremam dense breviter papillosis; filamenta in partibus superioribus ca. 0.45 mm longis valde inflata; thecae antherarum ca. 1.8 mm longae; appendices antherarum flavae ovatae ca. 0.35 mm longae et 0.3 mm latae extus glanduliferae; rami stylorum contorti vel spiraliter recurvati extus et in apicibus scaporum dense glanduliferi. Achaenia leniter complanata interdum triangularia vel subquadrangularia ca. 3.5 mm longae base angustiora superne pustulifera margine anguste lobato-alata; aristae pappi 2 brevia 0.5–1.0 mm longae; squamellae pappi in marginis lateralibus connatae irregulariter denticulatae. Grana pollinis in diametro ca. 26  $\mu\text{m}$ .

*Type.*—BRAZIL; Bahía: Espigão Mestre. Extensive limestone outcrop 6 km S of Cocos, and adjacent pastures; elev. 520 m. Perennial herb 1.5 m tall; flowers yellow. 16 Mar 1972. W. R. Anderson, M. Stieber, J. H. Kirkbride, Jr. 37028 (Holotype UB; isotype US).

*Angelphytum bahiense* occurs well to the northeast of other known members of the genus. The new species has opposite, petiolate, broadly bladed leaves, and lobate-margined achenes with reduced awns which indicates relationship to *A. tenuifolium* of northern Argentina and Paraguay. The present species is most easily distinguished by the recurved tips on the involucre bracts and the presence of any pappus awns.

*Angelphytum grisebachii* (Baker) H. Robinson, comb. nov.

*Verbesina grisebachii* Baker in Martius, Fl. brasil. 6(3):214. 1884. *Zexmenia grisebachii* (Baker) Hassler, Fedde Repert. 14: 157. 1915. Argentina, Paraguay, Uruguay.

*Angelphytum hatschbachii* H. Robinson, sp. nov.

Plantae herbaceae perennes ad 50–75 cm altae non vel pauce ascendenter ramosae; xylopodium distinctum. Caules rubescentes teretes dense antrorse strigosi. Folia alterna aliquantum dense spiraliter inserta ascendentia sessilia linearia vel anguste elliptica plerumque 1.0–2.5 cm longa et 1–2 mm lata margine integra plana vel leniter inflexa apice breviter acuta supra et subtus dense breviter strigosa subtus distincte tricostata et interdum subtiliter ascendenter pinnato-nervata. Inflorescentiae in ramis solitariae terminales, pedunculis ca. 2–3 cm longis dense canescentiter antrorse strigosis. Capitula late infundibularia 9–11 mm alta; squamae involucri ca. 20 ca. 2-seriatae anguste oblongae 7–9 mm longae et 1.5–2.0 mm latae apice breviter acutae extus dense canescentiter strigosae interiores margine late glabrae scariosae; paleae fulvescentes ca. 8 mm longae distaliter oblongo-ovatae planae apice breviter pungentiter acutae extus subglabrae. Flores radii ca. 12 in capitulo; corollae flavae, tubis angustis ca. 1.3 mm longis glabris, limbis anguste oblongis ca. 8 mm longis et 2.7 mm latis extus setiferis et dense glandulopunctatis margine in sinibus minute puberulis. Flores disci ca. 25 in capitulo; corollae flavae 4.0–4.3 mm longae; tubis ca. 0.8 mm longis glabris; faucibus cylindraceutis base campanulatis ca. 2.7 mm longis glabris, lobis ovato-triangularibus ca. 0.7 mm longis et 0.6 mm latis extus superne multo glandulopunctatis apice pauce spiculiformiter papillosis in sinibus pauce puberulis intus praeter basem extremam dense breviter papillosis; filamenta in partibus superioribus ca. 0.35 mm longa valde incrassata; thecae antherarum 1.8–2.0 mm longae; appendices antherarum flavae ovatae ca. 0.4 mm longae et 0.35 mm latae extus glanduliferae; rami stylorum longi-lineares valde recurvati extus supra mediam distincte glanduliferi. Achaenia complanata vel triquetra ca. 5 mm longa et 1.5 mm lata (ala exclusa) margine late alata in superficiis lateralibus superne sensim multo setulifera; aristae pappi 1–3 anguste subulatae triquetrae 2–3 mm longae in alis angustis interaristatis margine lateralibus breviter setulifera. Grana pollinis in diametro ca. 27  $\mu$ m.

*Type*.—BRAZIL: Mato Grosso do Sul: Ponta Porã, 30 km O. Campo limpo. Alt. 800 m. Ereta, capitulos amarelos. 11 Feb 1983. G. Hatschbach 46131 (Holotype MBM; isotype US).

*Angelphytum hatschbachii* is one of two species described here with spirally inserted linear leaves. From the other, *A. reitzii*, the present species differs by the subequal lengths of the involucre bracts, the more tapering rather than basally rounded shape of the head, the leaves without recurved margins, the achenes with a more continuous setuliferous wing between the awns, and the disk corolla lobes that have no setulae outside but have longer spiculiform papillae outside at the tip.

*Angelphytum hieronymi* (Hassler) H. Robinson, comb. nov.

*Zexmenia hieronymi* Hassler, Fedde Repert. 14:157. 1915. Argentina, Paraguay.

*Angelphytum indutum* (Chod.) H. Robinson, comb. nov.

*Aspilia induta* Chod. in Chod. & Hassler, Bull. Herb. Boiss., ser. 2, 3:720. 1903.

*Zexmenia induta* (Chod.) Hassler, Fedde Repert. 14:180. 1915. Paraguay.

*Angelphytum matogrossense* G. M. Barroso

*Angelphytum matogrossense* G. M. Barroso, Bol. Soc. Argent. Bot. 19(1–2):9. 1980. Brazil: Mato Grosso.

*Angelphytum myrtifolium* (Chod.) H. Robinson, comb. nov.

*Verbesina myrtifolia* Chod. in Chod. & Hassler, Bull. Herb. Boiss., ser. 2, 2:393. 1902. *Zexmenia myrtifolia* (Chod.) Hassler, Fedde Repert. 14:180. 1915. Brazil: Mato Grosso, Paraguay.

*Angelphytum oppositifolium* (Saenz) H. Robinson, comb. nov.

*Zexmenia oppositifolia* Saenz, Hickenia 1(54):285. 1982. Argentina: Misiones, Brazil: Santa Catarina.

*Angelphytum paraguariense* (Chod.) H. Robinson, comb. nov.

*Verbesina paraguariensis* Chod. in Chod. & Hassler, Bull. Herb. Boiss., ser. 2, 3: 722. 1903. *Zexmenia paraguariensis* (Chod.) Blake, Contrib. Gray Herb., n.s., 52:52. 1917. Paraguay.

*Angelphytum pseudosilphioides* (Hassler) H. Robinson, comb. nov.

*Zexmenia pseudosilphioides* Hassler, Fedde Repert. 14:263. 1916. Paraguay.

*Angelphytum reitzii* H. Robinson, sp. nov.

Plantae herbaceae perennes ad 50–60 cm altae non vel paucè ascendenter ramosae; xylopodium distinctum. Caules rubescentes teretes dense antrorse vel leniter subpatenter strigosi raro hispidi. Folia alterna aliquantum dense spiraliter inserta ascendenter sessilia linearia vel anguste elliptica plerumque 1–5 cm longa et 0.15–0.35 mm lata integra margine distincte leniter reflexa apice breviter acuta supra et subtus dense strigosa subtus solum in nervis primariis prominentia. Inflorescentiae in ramis terminales plerumque 1–2-capitatae, pedunculis 1–2 cm longis dense canescenter antrorse strigosis. Capitula late campanulata 8–10 mm alta; squamae involucri exteriores 6–10 oblongae herbaceae 5–8 mm longae et 1.5–2.0 mm latae integrae apice obtusae extus dense canescenter strigosae; bractae interiores 12–14 oblongo-lanceolatae ad 8–9 mm longae et 2 mm latae breviter acutae margine inferne scariosae superne leniter sinuatae dense hirtello-fimbriatae extus ad medio late dense canescenter strigosae; paleae bracteis interioribus similes angustius acutae margine scabridulae extus sparsius strigosae. Flores radii 12–14 in capitulo; corollae flavae, tubis angustis ca. 2 mm longis subglabris, limbis anguste oblongis ca. 10 mm longis et 2.5 mm latis extus setuliferis minute puberulis et dense glandulo-punctatis. Flores disci ca. 50–70 in capitulo; corollae flavae 4.0–4.5 mm longae; tubis 1.0–1.5 mm longis glabris, faucibus cylindraceutis base campanulatis ca. 2.5 mm longis glabris vel superne in nervis paucè setuliferis, lobis ovato-triangularibus ca. 0.8 mm longis et 0.6 mm latis extus sporadice setuliferis et minute multo glanduliferis intus praeter basem extremam dense breviter papillois; filamenta in partibus superioribus ca. 0.35 mm longa valde incrassata; thecae antherarum ca. 2 mm longae; appendices antherarum flavae ovatae ca. 0.35 mm longae et latae extus glanduliferae; rami stylorum longe lineares spiraliter contorti extus et in apicibus scaporum glanduliferi supra mediam distincte puberuli. Achnaenia complanata vel triquetra ca. 3.5–4.0 mm longa et 1.0–1.5 mm lata vix vel late alata in superficiis lateralibus minute setulifera; aristae



pappi 1–3 anguste subulatae triquetrae 1.5–2.0 mm longae, marginis interaristatis interrupte alatae et vix squamelliferae. Grana pollinis in diametro ca. 25–27  $\mu\text{m}$ .

*Type*.—BRAZIL: Paraná: Mun. Guarapuava. Fazenda 3 Capões, do campo sêco. Xilopodifera, 50 cm de altura, capitulos amarelos. 19/I/1968. G. Hatschbach 18327 (Holotype MBM; isotype US).

*PARATYPES*:—BRAZIL: Paraná: Guarapuava. Fazenda 3 Capões. Campo. Alt. 1000 m. Erva, flôr amarela. 16 Dec 1965.—Reitz & Klein 17756 (US); Santa Catarina: Mun. Xanxerê. 4 km north of Abelardo Luz, campo, alt. 500–600 m. 25 Dec 1956.—L. B. Smith & Pe. R. Reitz 9250 (US); 7 km north of Abelardo Luz, campo, alt. 500–600 m. 19 Feb 1957.—L. B. Smith & R. Klein 11481 (US); Mun. Chapecó, Fazenda Campo São Vicente 24 km west of Campo Erê, campo, by rancho, alt. 900–1000 m. 20–21 Feb 1957. L. B. Smith & R. Klein 11557 (US).

The distinctions of *Angelphytum reitzii* are discussed above under the closely related *A. hatschbachii*. One of the paratype specimens, Smith & Klein 11557, differs from the other specimens by having a more hispid or hirtellous rather than strigose pubescence.

*Angelphytum tenuifolium* (Hassler) H. Robinson, comb. nov.

*Zexmenia tenuifolia* Hassler, Fedde Repert. 14:178. 1915. Argentina, Paraguay.

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