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ADDITIONAL SPECIES OF *SENECIO* SECTION  
*PALMATINERVII* (ASTERACEAE) FROM  
NORTHEASTERN MÉXICO

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ABSTRACT

Two new species of *Senecio*, *S. metepecus* and *S. nesomiorum*, belonging to the sect. *Palmatinervii*, are described, illustrated and compared to their nearest relatives.

KEY WORDS: *Senecio*, Asteraceae, systematics, México.

Ongoing botanical explorations of the geologically complex Sierra Madre Oriental of northeastern México have revealed two new species of *Senecio* belonging to the sect. *Palmatinervii* (Roldana, sensu Robinson & Brettell 1974), as circumscribed by Barkley (1985). *Senecio nesomiorum* is closely related to *S. marquezii* (Turner 1988), while *S. metepecus* is closely related to *S. platanifolius*.

*Senecio metepecus* B. Turner, sp. nov., Figure 1. TYPE: MÉXICO.

Hidalgo: Mpio. de Tenango de Doria, 18 km NNE of Metepec, "sobre camino de terraceria que va de Metepec a Tenango de Doria," forest of *Pinus leiophylla* and *Alnus*, 2200 m, 31 Oct 1977, Jose Garcia P. 514 (holotype TEX!; isotype CHAPA).

*Senecio platanifolius* Benth. similis sed capitulis radiatis et involucri et pedunculis ultimis pubescentibus trichomatibus multiseptatis purpurascens differt.

Perennial herbs 45-80 cm high. Stems simple, arising from slender rhizomes, purple, terete, moderately pubescent with purple-septate, crinkled trichomes. Leaves few (ca 4 to a stem), clustered near the base, reduced upwards; petioles (of lowermost leaves) 4-5 cm long, pubescent like the stems; blades broadly oval in outline, 7-8 cm wide, 6-7 cm long, 5-7 lobed, palmately veined from the base, moderately puberulent on both surfaces. Heads 11-15, eradiate, broadly turbinate, arranged in a lax terminal, relatively naked, raceme. Involucres ca 12 mm high, the bracts ca 13 in 2 equal, overlapping

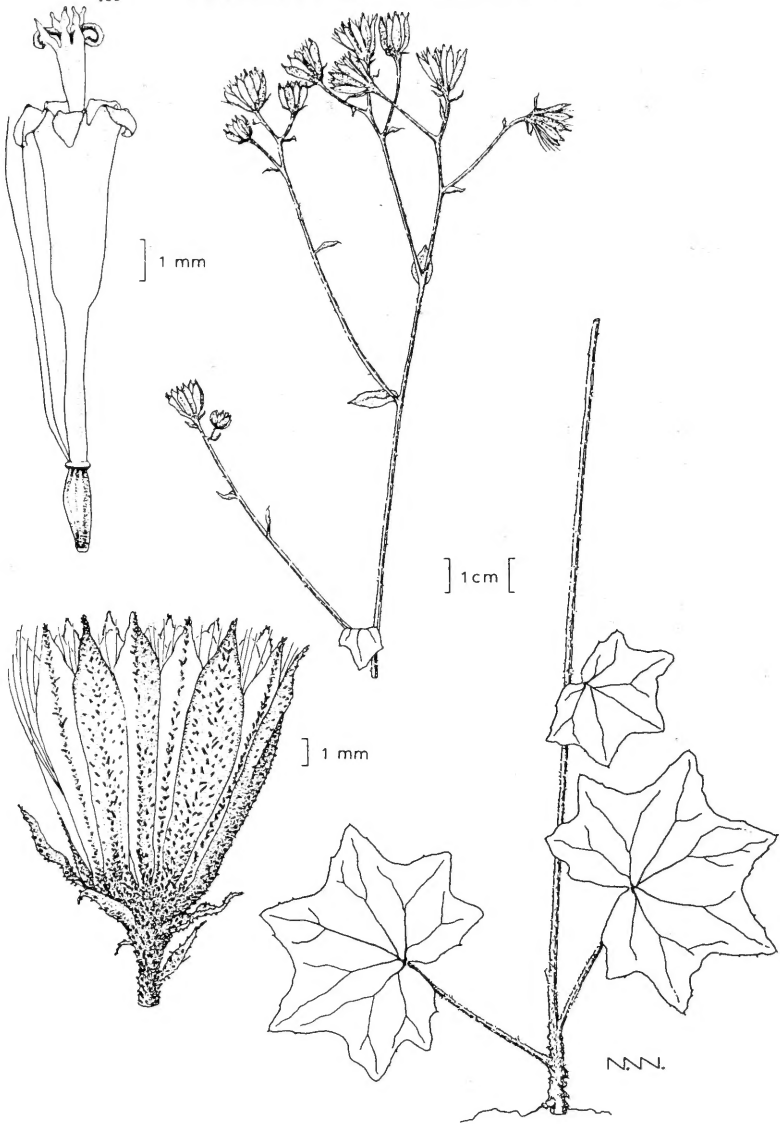


Fig 1. *SENECIO METEPECUS*, from holotype.

series, densely pubescent with short purple hairs, the margins scarios, especially those of the inner series. Disk florets 20-30; corollas yellow, glabrous, 10 mm long, the tube ca 4 mm long, the lobes ca 1.5 mm long. Achenes (immature) ca 3 mm long, glabrous, the pappus of numerous delicate, ciliate bristles ca 10 mm long.

The species resembles *Senecio platanifolius* Benth., but the leaves are fewer and largely restricted to the base of the plant, the capitulescence is relatively naked with much reduced leafy-bracts; in addition, the heads are eradiate and the ultimate peduncles and involucre are pubescent with purplish, multiseptate trichomes.

The collector's label describes the plant as an "herbacea anual, erecta, de 80 cm de alto," but the plant is clearly a rhizomatous perennial, the specimen on the holotype measuring ca 45 mm high.

*Senecio nesomiorum* B. Turner, sp. nov., Figure 2. TYPE: MÉXICO.

Nuevo Leon: Mpio. Doctor Arroyo, ca 35 mi NE of Doctor Arroyo, NE of San Antonio Peña Nevada, N side of Cerro Peña Nevada, along road ca 2 mi N of "El Puerto," scattered in an oak woodland in relatively level terrain (23°45' N, 99°52' W), 2650 m, 15 Sep 1988, *Guy Nesom 6712* [with Julia Wells] (holotype TEX!; isotype MEXU!).

*Senecio marquezii* B. Turner similis sed caulibus et foliis ubique brevipuberulis phyllariis minoribus non villosis, flosculis radii paucioribus (8-11 vs 13-21), et acheniis glabris differt.

Suffruticose perennial herbs to 1.8 m high. Stems terete, purplish, somewhat maculate, densely short puberulent to glabrate. Leaves (upper) alternate, ca 12 cm long, 8 cm wide; petiole ca 4 cm long; blades broadly flabellate, ca 6 cm long, 8 cm wide, 7-9 lobate, palmately nervate, truncate to subcordate at the base, puberulent beneath. Heads ca 35, radiate, arranged in a rather narrow, corymbose, panicle ca 30 cm long and 10 cm wide, the ultimate peduncles mostly 5-15 mm long. Capitulescence with pronounced obovate or subflabelliform bracts 3-6 cm long, 1-4 cm wide. Involucre campanulate, biseriate, ca 9 mm high, ca 15 mm wide, loosely invested by 2-4 foliaceous bracts 12-20 mm long, the bracts ca 11, ovate-elliptic, minutely puberulent, the apices acute. Ray florets 8-11, pistillate, fertile, the ligules yellow, 11-13 mm long, 3-4 mm wide, 3-5 nervate, the tube ca 6 mm long. Disk florets 50-70, the corollas glabrous, yellow, the tube ca 4 mm long, the throat ca 3 mm long, the lobes ca 1 mm long. Achenes (immature) glabrous, the pappus of numerous, white, barbellate bristles 7-8 mm long.

The species is closely related to the recently described *S. marquezii* B. Turner and *S. grimesii* B. Turner, possessing the rayed heads of the former and the glabrous achenes of the latter. All three species have large heads with relatively loose outer whorls of 2-4 foliaceous bracts which are somewhat longer than the subtended involucre bracts.

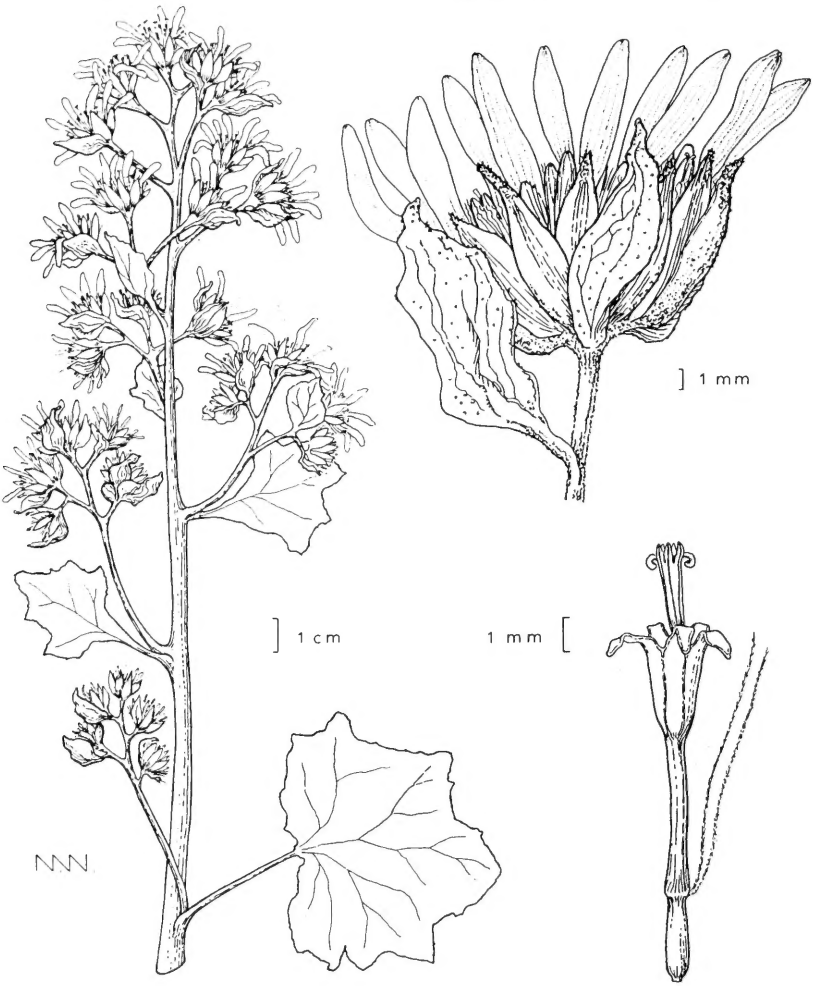


Fig 2. Senecio nesomiorum, from holotype.

It is a pleasure to name this species for my colleague, Guy Nesom, and Julia Nesom (nee Wells), who were engaged at the time they collected the type material; they have since married and I take this opportunity to wish them a lifetime relationship.

#### ACKNOWLEDGMENTS

I am grateful to Dr. Ted Barkley and Dr. G. Nesom for critical comments; the latter provided the Latin diagnoses. Nancy Webber provided the illustrations.

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- Turner, B.L. 1988. Two new species of *Senecio* section *Palmatinervii* (Asteraceae) from eastern México. *Brittonia* 40:81-84.

**PALICOUREA STEYERMARKII, A NEW NAME FOR  
PALICOUREA GARCIAE STEYERMARK  
(RUBIACEAE)**

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ABSTRACT

***Palicourea steyermarkii*** C.M. Taylor is presented as a substitute for *Palicourea garciae* Steyermark which is a later homonym of *Palicourea garciae* Standley.

KEY WORDS: *Palicourea*, Rubiaceae, nomenclature.

***Palicourea steyermarkii*** C.M. Taylor, nom. nov. Avowed replacement for *Palicourea garciae* Steyermark, Acta Bot. Venez. 6:167. 1971. TYPE: VENEZUELA, Aragua: Fila del Paraso, Rancho Grande, 1375 m, *F. Garcia 55* (holotype: VEN). Non *Palicourea garciae* Standley, Publ. Field Mus. Nat. Hist., Bot. Ser. 22:195. 1940. TYPE: COLOMBIA. El Valle: San Antonio, west of Calí, near summit of Cordillera Occidental, 1900-2350 m, Feb-Mar 1939, *Killip & Garcia 33660* (holotype: F; isotypes: A! NY!).

The substitute name honors Dr. Julian A. Steyermark.

ACKNOWLEDGMENTS

I am grateful to Dr. James Ackerman and Dr. George Proctor for reviewing the manuscript.



## THE ERIGERONS (COMPOSITAE: ASTEREAE) OF BASASEACHIC NATIONAL PARK CHIHUAHUA, MÉXICO, INCLUDING A NEW SPECIES

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### ABSTRACT

Ten species of *Erigeron* have been found in the Parque Nacional de Basaseachic in southwestern Chihuahua, México. One of these, *E. fundus* which occurs only in the barranca, is proposed in this paper as new. Two other species, *E. podophyllus* Nesom and *E. basaseachensis* Nesom, also are apparently endemic to the park. A key is presented to all ten species plus two others that are common in the surrounding area of southwestern Chihuahua.

KEY WORDS: *Erigeron*, Asteraceae, México, taxonomy.

El Parque Nacional de Basaseachic in southwestern Chihuahua includes a plateau area primarily of pine and pine-oak woods at about 2000-2200 meters elevation as well as riparian habitats and vegetation along the Río Durazno and Río Candameña, which meet there and drop precipitously into a huge barranca 330 meters below. Within this small area are ten species of *Erigeron* (Spellenberg *et al.* unpubl. mss.). Three of these apparently are endemic to the park, one of the endemics is proposed as new to science in the text below; the other two belong to a section of the genus treated in a separate paper (Nesom 1989). A key for the identification of all the *Erigeron* species in the park, as well as two others that occur in the closely surrounding areas is presented.

***Erigeron fundus* Nesom, sp. nov.** TYPE: MÉXICO. Chihuahua: Mpio. Ocampo, ca 16 km (air) ENE of Ocampo, ca 2.5 km S of village of Basaseachic, base of Cascada de Basaseachic, in deep barranca, 28° 02' N, 107° 55' W, 27 Apr 1986, *G. Nesom 5437* with Spellenberg *et al.* (holotype: TEX!; isotypes: ARIZ!, COLO!, GH!, MEXU!, MO!, NY!).

*Erigeron flagellari* A. Gray similis sed foliis basalibus spatulatis laminis obovati-orbicularibus, caulibus pubescentia patenti-deflexa, flosculis radii paucioribus, corollis disci longioribus, et setis pappi numerosioribus.

Short-lived perennials from fibrous roots, producing slender rhizomes and forming mats from filiform, flexuous runners up to 50 cm long, these often with plantlets at the tips. Erect stems 1 per rosette, unbranched, 13-18 cm tall, sparsely to moderately pubescent with spreading to slightly deflexed hairs 0.5-1.0 mm long, sparsely stipitate-glandular at least on the upper third, often densely so immediately below the heads. Leaves sparsely pubescent to glabrous above, fewer hairs beneath, the margins ciliate; basal leaves in a rosette, 15-50(-80) mm long, spatulate, the blades broadly obovate to nearly orbicular, 7-22 mm wide, sharply attenuate basally to a narrow petiolar region  $1/2-3/5$  as long as the leaf, the margins with 2-3 pairs of serrations, sinuations, or shallow lobes, sometimes simply mucronulate or nearly entire, the apex rounded; cauline leaves (on erect stems and runners) sharply differentiated from the basal, oblong-obovate, entire with a pair of minute teeth, sessile, non-clasping, relatively uniform in size and evenly spaced, 5-12 mm long, 2-5 mm wide. Heads solitary, shallowly hemispheric, 7-10 mm wide (pressed); phyllaries in 2-3(-4) subequal series, the inner 4.0-4.5 mm long, all thin-herbaceous, sparsely spreading-pubescent as well as stipitate-glandular, lanceolate to oblanceolate with short-acuminate tips, usually fused into a basal ring, the margins scarious-lacerate and sometimes purplish. Ray flowers 32-50 in 1(-2) series, the corollas white, drying white or sometimes with a faint, purple midstripe beneath, 8.0-10.5 mm long, the ligules 0.5-1.5 mm wide, 3-4(-5) veined, the tube sparsely pubescent with biseriate trichomes. Disc corollas tubular-funnelform, not inflated or indurated, 3.0-4.5 mm long; style branches 0.5-0.7 mm long, including the deltate to shallowly triangular collecting appendages 0.1-0.2 mm long. Achenes sparsely strigose, oblong, compressed, ca 1 mm long, fully mature not observed, with 2 thin, orange-brown ribs; pappus of 16-25 bristles 2.1-3.8 mm long, outer series of a few, minute setae ca 0.1 mm high.

Apparently endemic to the area at the base of La Cascada de Basaseachic in southwestern Chihuahua; along the river below the falls, N-facing slope, mostly on banks of relatively bare soil with few other herbaceous flowering species but often densely covered by bryophytes, inside woods of *Cupressus*, *Pseudotsuga*, *Acer*, *Tilia* and *Frazinus* that grade into pine-oak in some areas; 1700-1750 m; flowering Mar-April(-June).

Additional collections examined: MÉXICO, Chihuahua: [Type locality]: 16 May 1985, *Lavin et al.* 5410 (TEX); 18 Aug 1984 (past fruit), *Nesom* 5106 with Lewis (ENCB,MEXU,NY,TEX,US); 26 Apr 1985, *Spellenberg et al.* 8012 (MEXU,NMC,NY,TEX,US).

The straight ligules (vs coiling or reflexing), nodding buds, and small achenes with persistent pappus place *Erigeron fundus* in sect. *Oligotrichium* Nutt. of which *E. flagellaris* A. Gray and *E. divergens* Torr. & Gray are members. The new species is very similar in habit to *E. flagellaris* in its

slender, herbaceous, leafy stolons and solitary heads on erect, unbranched stems. The latter, however, has appressed stem pubescence, mostly elliptic (vs orbicular) basal leaf blades, more ray corollas (50-125 vs 32-50), shorter disc corollas (2.5-3.5 vs 3.0-4.5 mm long), and fewer pappus bristles (10-15 vs 16-25). Also, the basal fusion of phyllaries that occurs in *E. fundus* can be seen in various species in the genus but never in *E. flagellaris*.

Artificial key to the *Erigeron* species  
of El Parque Nacional de Basaseachic

1. Achenes with a coroniform pappus less than 0.2 mm high, without bristles ..... (2)
1. Achenes with a pappus of bristles as long as the disc corollas ..... (4)
  2. Plants perennial; stem pubescence ascending to spreading or deflexed; cauline leaves coarsely toothed to pinnatifid; rays reflexing at the tube-ligule junction, not coiling; Chihuahua and adjacent Sonora ..... *E. wislizeni* (A. Gray) E. Greene\*
  2. Plants annual or perennial; stem pubescence appressed; cauline leaves entire or nearly so, never coarsely toothed; rays straight or coiling at the tips, not reflexing ..... (3)
3. Plants annual, without basal offsets; cauline leaves clasping to subclasping; heads 7-12 mm wide; ray flowers 80-200, the corollas (6.0-)8.5-16.0 mm long; Chihuahua and adjacent Sonora .. *E. strigulosus* E. Greene
3. Plants perennial, producing basal offsets or short rhizomes; cauline leaves not at all clasping; heads 5-7(-9) mm wide; ray flowers (18-)24-80, the corollas 5.4-9.5 mm long; Chihuahua to central Durango ..... *E. fraternus* E. Greene
  4. Plants producing long, leafy, herbaceous stolons. .... (5)
  4. Plants sometimes producing rhizomes but not leafy, herbaceous stolons ..... (6)
5. Basal leaves with elliptic blades; rays 50-125; pappus bristles 10-15; western United States to central México ..... *E. flagellaris* A. Gray
5. Basal leaves with obovate-orbicular blades; rays 32-50; pappus bristles 16-25; Basaseachic endemic ..... *E. fundus* Nesom
  6. Plants annual; heads 2-3 mm wide; phyllaries 2.0-3.3 mm long; Chihuahua and Sonora to Colima and Michoacán ..... *E. velutipes* Hook. & Arn.
  6. Plants perennial; heads 6-20 mm wide; phyllaries 3.3-11.5 mm long ..... (7)

- 7. Basal leaves absent; rays usually purplish, the ligules 1.4-2.4 mm wide, not reflexing or coiling; disc corollas 4.8-6.0 mm long; pappus bristles 34-50, persistent; Chihuahua to northern Durango ..... *E. lepidopodus* (B. Rob. & Fern.) Nesom\*
- 7. Basal leaves present or absent; rays white, the ligules 0.8-1.8 mm wide, reflexing at the tube-ligule junction; disc corollas 2.0-4.5 mm long; pappus bristles (8-)10-12(-17), basally caducous, breaking off at the slightest touch ..... (8)
  - 8. Cauline leaves apically toothed, not pinnatifid or bracteate; ray flowers mostly 85-120; pappus bristles 11-17; Basaseachic endemic ..... *E. podophyllus* Nesom
  - 8. Cauline leaves pinnatifid (or bracteate in *E. eruptens*); ray flowers 26-150; pappus bristles (8-)10-12 ..... (9)
- 9. Plants mostly 10-30 cm tall, with rhizomes or rhizome-like caudex branches; basal rosette present at flowering; stems usually unbranched, sometimes with 1-2 simple branches; ray flowers 26-72 ..... (10)
- 9. Plants mostly 25-90 cm tall, without rhizomes; basal rosette absent at flowering; stems usually with 2-20 primary branches, these with secondary and tertiary branches; ray flowers 70-150 ..... (11)
  - 10. Plants with thick, ascending, sometimes rhizome-like caudex branches; stems essentially scapose, spreading-pubescent; stems and phyllaries minutely granular-glandular; heads 8-15 mm wide; central to southern Chihuahua ..... *E. eruptens* Nesom
  - 10. Plants with slender, brittle, lateral rhizomes; stems with reduced cauline leaves but not essentially scapose, appressed-pubescent; stems and phyllaries eglandular; heads 6-9 mm wide; Basaseachic endemic ..... *E. basaseachensis* Nesom
- 11. Stems, leaves and phyllaries very sparsely hispid-pilose with trichomes averaging 1.0 mm long, at least the peduncles and phyllaries densely stipitate-glandular; Arizona, New Mexico, Chihuahua, Sonora ..... *E. oreophilus* Greenm.
- 11. Stems, leaves and phyllaries moderately to densely appressed-strigose to hirsute with trichomes averaging 0.4 mm long, eglandular or sometimes minutely granular-glandular on the peduncles and phyllaries; Arizona, New Mexico, Chihuahua, Sonora ..... *E. neomezicanus* A. Gray

\* *Erigeron wislizeni* has been collected in the town of Basaseachic (*Nesom 5117* - NMC,TEX) and numerous other close localities; *E. lepidopodus* is known slightly to the east of the park: 18 mi SW of Basaseachic (*Nesom 5420* - MEXU,NMC,TEX); ca 12 mi SE

of Basaseachic (*Spellenberg 8061* - NMC); Mojarachic (*Knobloch 6013* - TEX). Neither species is known from within the park boundaries.

#### ACKNOWLEDGMENTS

I thank Billie Turner and Rich Spellenberg for their comments and criticisms of this manuscript.

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A NEW COMBINATION IN *LEPIDOCORDIA*  
(BORAGINACEAE)

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ABSTRACT

*Lepidocordia williamsii* (I.M. Johnston) J.S. Miller is presented as a new nomenclatural combination.

KEY WORDS: *Lepidocordia*, Boraginaceae, Neotropics, systematics.

Recent studies of Boraginaceae for the Flora de Nicaragua and Flora of the Venezuelan Guayana have necessitated study of generic delimitation in the Ehretioideae. The characters that have been used to separate the genera *Antrophora* and *Lepidocordia* are not valid and the two genera should be merged. A complete study of *Lepidocordia* (Miller & Nowicke, in prep.) will be published later but the following new combination is published to validate the name for the Flora de Nicaragua.

*Lepidocordia williamsii* (I. M. Johnston) James S. Miller, comb. nov.  
Based on *Antrophora williamsii* I. M. Johnston, J. Arnold Arbor. 31:  
172. 1950.

## A REVISED SYNOPSIS OF THE PINES 3: THE PARASOL PINE (*PINUS*, SECTION *PINEA*)

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### ABSTRACT

Section *Pinea*, here emended, comprises the sole species *Pinus pinea* whose reproductive characters and behavior differ importantly from those of other sections by the combination of 4 "actions:" 1) the species spends 2 years and one quarter to grow and mature its cones; 2) the short, truncate seed wings stay stuck to the cone scales; 3) the tree crown adopts a wide parasol shape to better dissemination; 4) its geographic distribution is very maritime.

KEY WORDS: *Pinus*, Pinaceae, systematics.

### INTRODUCTION

This treatment of *Pinus pinea* is in line with the one which I published in 1974 (p. 774) wherein I had given paramount importance to the three growth seasons totaling two years and three months, required by *Pinus pinea* Linné and *Pinus leiophylla* Schl. & Cham. to develop their seeds.

Within a plant genus - any plant genus - what species other than these two pines grow their fruits in two years and a quarter (2 1/4 years) over a succession of three growth seasons (stadia)? By the expression "three growth stadia," I mean this: **Year 1:** strobile to small conelet; **Year 2:** small conelet to bigger conelet; **Year 3:** bigger conelet to fully grown cone. I have tried without success to find some. I could find some *Juniperus* (e.g. *Juniperus scopulorum*) with fully grown fruits in one season, but taking up to two more growth seasons to ripen. I also noticed that *Alnus maritima* showed a belatedness of less than one year. But that was all.

Can someone provide me with more information? Some authors erroneously reported that *Cedrus* matures its fruits in the second or third year. In fact, they all do it in the second year.

I can assume that the two pines mentioned above experienced some sort of genetic transformation as an efficiency measure. But, what was that measure?

I feel baffled, and marvel at these facts. A sagacious person once said: "Could human intelligence foresee such tree species, if they did not exist?"

Such an astounding time behavior produces the following morphological traits: on the branchlets we notice two sets of conelets, the standard one-summer conelets, and the "odd-ball" two-summer conelets whose little scales have an umbo. Then the cones themselves develop during the third summer, showing a peculiar double, ring-like umbo.

That time behavior seems as notable as the mysteriously refined vegetative sequence of the pine seedlings which, out of the plantule stadium with its cotyledons, grow "green needles on the long shoots, but later these bear only brown scale leaves, producing in the same year axillary short shoots, the contracted axes of which first bear a few membranaceous bracts (the leaf sheaths) and then a definite number (characteristic of the species) of green needles." (after Firbas 1965, p. 609).

We can see, by observing those two phenomena, that the genus *Pinus* is indeed most advanced.

Accordingly, in 1974 (p. 774) I had proposed that *Pinus pinea* and *P. leiophylla* should be classified much apart, namely in a separate subgenus, subgenus *Pinea*, whose full name and emended description were given and are copied as follows: (English translation while keeping the Latin words):

"Subgenus *Pinea* (Endlicher) stat. nov., Basionym: *Pinus* section *Pinea* Endlicher - Synopsis Coniferarum p. 182 (1847), pro parte typica. Holotype - *Pinus pinea* Linné. Descriptio nova - Strobili triennes; umbo dorsalis duplex, concentrica; pseudophylli sicut subgenus *Pinus*.

That subgenus comprises essentially the pine species whose cones mature in three growth seasons—it is constituted by two monospecific sections.

#### SECTION *PINEA* EMEND.

The golden rule of dendrology is: when you have the choice between complication and simplification choose the latter. In accordance, I diagnose section *Pinea* by only two essential characters: double ring-like umbos and seeds with a very short ineffective (here caducous) wing. That is analogous to what I had done with sections *Quinquefoliis* and *Cembra*.

The epithet of this section was first published by Endlicher (1847, p. 182) who included various species: *Pinus pinea* (type), *P. cembroides*, etc., which matched his description: 1) pyramidal apophyses, 2) dorsal umbos 3) wingless seeds, 4) leaves 2-fascicled or rarely 3-fascicled.

My emended, more complete description is more restrictive, since it concerns only *Pinus pinea* Linné (monotype): Strobiles maloides, umbone dorsali et duplex, semina grandia (15-20 mm), ala brevi truncata et separabili. Folia 2. Arbores parasoles, maritimissimi.



-Apple-like cones with dorsal, double umbos. Seeds long (15-20 mm) with a truncate, short, deciduous wing. Leaves 2 in a fascicle. Parasol-shaped trees when older. Very maritime species.

-Cônes en forme de pomme, à ombilic dorsal double. Graines longues (15-20 mm), à aile tronquée, courte, caduque. Aiguilles groupées par 2. Les arbres plus vieux se forment en parasol. Espèce très maritime.

I do not include *Pinus leiophylla* in section *Pineae* because there are six main features that separate it from *Pinus pinea*:

1. Though both species have double umbos, those of *Pinus pinea* are totally devoid of prickles.

2. The apple-like cones of *Pinus pinea* are, in France, called popularly *pommes de pin*, meaning pine apples. The cones of *Pinus leiophylla* are more conic.

3. The seeds of *Pinus pinea* have truncate at slanted angle, short, ineffective wings that stay stuck to the inner wall of the scale, thus leaving bare the seed when it is liberated.

4. Concerning the crown of the older trees, we cite Mitchell (1972, p. 233): "Very distinctly wide-domed on few stout branches ascending steeply from low on a short sinuous bole then dividing into radiating and ascending small branches to make a dense head" (Figure 1).

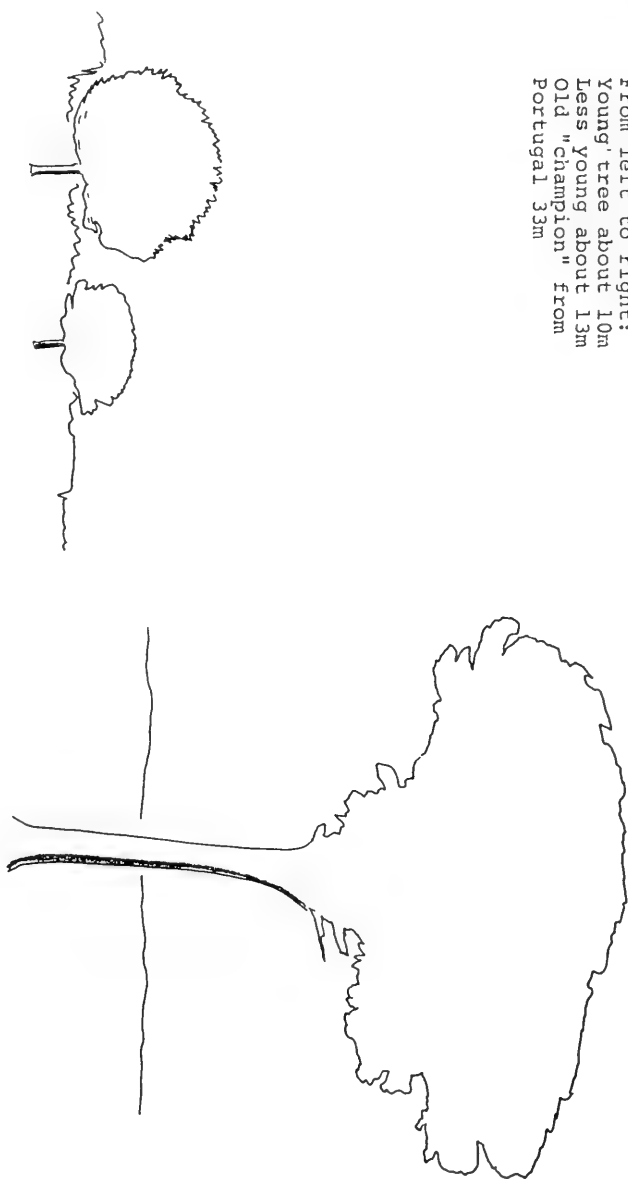
That shape originates from the relatively large size of the sub-terminal buds surrounding the terminal one, permitting an important lateral development of the crown at the expense of the height growth. Loudon (1838, p. 2225) had already described: "The surrounding buds are nearly as large as the central one."

5. The best-at-home specimens of *Pinus pinea* will be found in Spain and Portugal, where maritime influence is greater due to the proximity of the Atlantic Ocean. By looking at the map in Critchfield & Little (1966, p. 57) we notice that that pine is very maritime while *Pinus leiophylla* is neatly continental.

#### SUBSECTION *PINEAE*

Name by Little & Critchfield (1969, p. 12) whose choice to set apart the sole *Pinus pinea* was based on a combination of "leaves 2 in a fascicle, with persistent sheath; seeds large (15-18 mm) with short detachable wing."

Outline of 3 Parasol Pines  
From left to right:  
Young tree about 10m  
Less young, about 13m  
Old "champion" from  
Portugal 33m



After Becker et al. 1982, p. 256 (left group), and Elwes & Henry 1911, pl. 291

## RECOGNITION

Alan F. Mitchell's book (1972), entitled *Conifers in the British Isles* - for me is a prized reference due to precise descriptions made from living trees. The accurate drawings by Cristine Darter well complement them. Books describing pines with accuracy are far from common.

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## COMMENTS ON THE ANNUAL SPECIES OF *XANTHOCEPHALUM* (COMPOSITAE: ASTEREAEE) WITH A NEW COMBINATION

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### ABSTRACT

I recognize three species among the annual plants of *Xanthocephalum*: *X. gymnospermoides* (A. Gray) Benth. (with no infraspecific taxa), *X. benthamianum* Hemsl. and *X. eradiatum* (M. Lane) Nesom, comb. nov. A discussion of their morphological variation and geographic range and a key for their identification are presented.

KEY WORDS: *Xanthocephalum*, Asteraceae, México, systematics.

Lane's revision of *Xanthocephalum* (1983) and her transfer of taxa to *Gutierrezia* (1980a) were perceptive and timely. Additional collections and observations made since her study make it possible to offer a few refinements in taxonomy.

Lane recognized three varieties of *Xanthocephalum gymnospermoides*. She separated var. *intermedium* Lane from southern Chihuahua from the typical variety by its longer peduncles and monomorphic, completely epappose achenes. I find, however, that the differences in neither peduncle lengths nor achenial features are consistent enough to maintain var. *intermedium*. In *X. gymnospermoides* from southern to central Chihuahua, these characters are morphologically variable and intergrading, Lane herself noted that *X. gymnospermoides* (var. *gymnospermoides*) is a "highly variable taxon, with populations polymorphic for several characters," including achene morphology and peduncle length. The epithet of var. *intermedium* was coined to reflect her observation that it is "seemingly intermediate between *X. benthamianum* and *X. gymnospermoides* and could be associated with either" ... although "its characters grade more smoothly" into *X. gymnospermoides*. The plants from southern Chihuahua, however, are sharply differentiated in their glabrous leaves and certainly belong with the latter.

*Xanthocephalum benthamianum* was distinguished by Lane from *X. gymnospermoides* by its longer peduncles, "often auriculate-clasping leaves" (vs

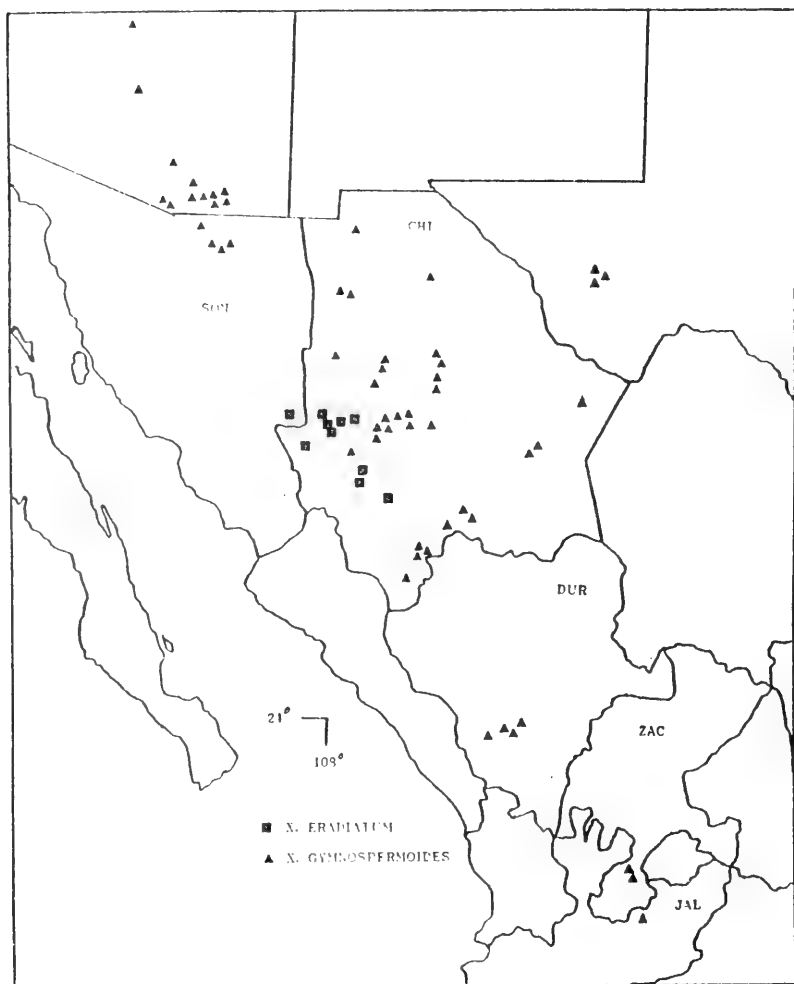
"decurrent"), and the stems and leaf surfaces stipitate-glandular (vs glabrous) like the peduncles and phyllaries. She mapped the species as having distinct and allopatric geographic ranges, *X. gymnospermoides* restricted to Chihuahua and northward, the other to central Durango and southward. Numerous plants from central Durango, however, have sessile, decurrent leaf bases, and a number of them have sessile leaf bases as well as perfectly glabrous leaf surfaces and lower stems (Barrie 1017) and Lane 2272, 2461, 2463, 2722, 2731 all TEX). These latter key to *X. gymnospermoides* var. *intermedium* in Lane's treatment but were annotated by her as *X. benthamianum*. Further, the heads of *X. benthamianum* have a strong tendency to be solitary, but when the capitulescence is branching, the peduncle lengths are in the same range as those of *X. gymnospermoides*. The inner disc achenes of *X. gymnospermoides* from Durango and southern Chihuahua to northern Chihuahua range from epappose to minutely coroniform to basally coroniform with teeth, scales, or bristles arising from the margin. The inner disc achenes of *X. benthamianum* are mostly epappose to minutely coroniform, but an erose-margined or minutely toothed corona can be observed from scattered localities over its range.

Despite these caveats, there do appear to be two taxa represented among the rayed annuals of *Xanthocephalum*, as distinguished in the key below. In central Durango, in the immediate area of the collections cited above, intermediates apparently with varying densities and heights of glandular trichomes can be distinguished, but if these are true hybrids, they do not occur in a wide zone. McVaugh (1984) noted that *X. gymnospermoides* and *X. benthamianum* "may well represent different races of the same species," but until populational studies in central Durango can be made, I believe Lane was correct in maintaining them as separate species.

Complicating this taxonomy, and perhaps supporting McVaugh's view that only a single species is represented, are plants from southern Zacatecas and northern Jalisco with densely corymbose capitulescences, glabrous stems and leaves, and very sparsely stipitate-glandular phyllaries. McVaugh recognized these as *Xanthocephalum gymnospermoides* var. *eglandulosum*, but Lane included them as forms of *X. benthamianum*, emphasizing their auriculate-clasping leaves and geographic proximity to populations of the latter. I treat them as *X. gymnospermoides* with the observation that disjunctions appear to be relatively common in this genus, although the gaps in the southern distribution of this species (Figure 1) may also reflect a lack of thorough collecting from the area.

Similar variation in the nature of leaf glandularity is known in species of genera related to *Xanthocephalum*. For example, in *Isocoma wrightii*, the leaves may be densely stipitate-glandular or the glands may be sunken so the leaf appears punctate with the resin spreading over its surface, although

Figure 1. Distribution of *Xanthocephalum gymnospermoides* and *X. eradiatum*.



these forms are not geographically segregated.

The pappus in species of *Xanthocephalum* is mostly absent or represented by a short corona, this sometimes with an erose or toothed margin. In contrast, a ring of 15-20 true, persistent, antrorsely ciliate, pappus bristles 0.8-1.4 mm high can be observed in scattered populations of *X. gymnospermoides* from Chihuahua (e.g., Lane 2494-TEX; Valdes R. 18-LL). I believe these represent vestigial occurrences of the primitive type of pappus for the genus and reflect its close relationship with *Grindelia* and *Isocoma* (see Nesom, Suh, & Simpson [submitted] for further comments and a phylogenetic summary). It is interesting to note that Steyermark, who had only recently monographed *Grindelia*, described a similar specimen from Chihuahua as *G. confusa* Steyermark with the comment that "it actually combines the habit, pubescence and involucral bracts of some of the Mexican species [of *Grindelia*] with the leaves and pappus awns of some southwestern United States species" (Steyermark 1938). Lane correctly recognized these plants (annotations in herb.) as conspecific with *X. gymnospermoides*, although she did not list the synonym as such in her revision of the genus (1983).

*Xanthocephalum gymnospermoides* var. *eradiatum* Lane is a taxon sharply distinguished by its lack of ray florets, although it is obviously related to and perhaps derived from typical *X. gymnospermoides*. Their geographic ranges are allopatric (Figure 1), however, and no intermediates have been observed between the two. Lane's analyses of flavonoid chemistry (1980b) showed that plants of var. *eradiatum* also have a strongly reduced number of flavonoid compounds compared to those of both typical *X. gymnospermoides* and *X. benthamianum*. She also noted that it has fewer disc florets and smaller involucres than *X. gymnospermoides*, although the two taxa are overlapping in these characteristics. No chromosome count for the eradiate plants has been made. The primary difference between var. *eradiatum* and *X. gymnospermoides* may rest on a simple genetic character, but the biological difference is at least potentially profound, and the eradiate plants are strongly differentiated geographically. The difference between var. *eradiatum* and *X. gymnospermoides* is as great as that between the latter and *X. benthamianum*, and I believe that the annual plants are best represented as three, separate though closely related species.

***Xanthocephalum eradiatum*** (M. Lane) Nesom, comb. nov. Based on *X. gymnospermoides* var. *eradiatum* M.A. Lane, Syst. Bot. 8:315. 1983.

Southwestern Chihuahua and adjacent Sonora; floodplains, meadows, fencerows, dry slopes, bases of bluffs, areas of pine-juniper or pine-oak woodlands; 1900-2400 m; Aug-Oct(-Nov).

*Xanthocephalum gymnospermoides* (A. Gray) Benth. in Benth. & Hook. f., Gen. Pl. 2:249. 1873. *Gutierrezia gymnospermoides* A. Gray, Smithsonian. Contr. Knowl. 5(Pl. Wright):79. 1853. *Grindelia gymnospermoides* (Gray) Ruffin, Rhodora 79:583. 1977.

*Grindelia confusa* Steyerl., Field Mus. Nat. Hist., Bot. Ser. 17:442. 1938.

*X. gymnospermoides* var. *eglandulosum* McVaugh, Contr. Univ. Michigan Herb. 9:367. 1972.

*X. gymnospermoides* var. *intermedium* Lane, Syst. Bot. 8:314. 1983.

Sonora, Chihuahua, central Durango, southern Zacatecas and northern Jalisco, Arizona and Texas; meadows, roadsides, ditches, river bottoms, grasslands or areas of oak scrub, oak-pine, or pine woodlands; 1150-2700 m; (Jul-)Aug-Oct.

*Xanthocephalum benthamianum* Hemsley, Biol. Centr. Amer., Bot. 2:110. 1881.

Durango, Zacatecas, Aguascalientes, Jalisco, Michoacán, [collections from Guanajuato, San Luis Potosí and México cited by McVaugh (1984)]; wet meadows, roadside depressions, swales, usually at least near standing water, commonly in areas of oak-pine or pine; 1900-2900 m; Jul-Sep(-Oct).

KEY TO THE ANNUAL SPECIES OF *XANTHOCEPHALUM*

- 1. Heads without ray florets ..... *X. eradiatum*
- 1. Heads with prominent rays ..... (2)
  - 2. Leaves and stems stipitate-glandular, auriculate-clasping to sessile and narrowly decurrent; heads often solitary but more commonly in corymbose clusters, the ultimate peduncles 10-59 cm long ..... *X. benthamianum*
  - 2. Leaves and lower stems glabrous, the leaves usually with glutinous surfaces, sessile and narrowly decurrent; heads very rarely solitary, usually in corymbose clusters, the ultimate peduncles 1-40 cm long ..... *X. gymnospermoides*

In conclusion, I view *Xanthocephalum* as comprising six species in two lineages, in each the taxa closely related among themselves but the whole genus clearly a monophyletic unit, as recognized by Lane (1982). The perennial line comprises *X. humile*, *X. durangense* M. Lane and *X. centauroides*; the annual line comprises *X. benthamianum*, *X. gymnospermoides* and *X. eradiatum*.



## ACKNOWLEDGMENTS

I appreciate the observations of Young-bae Suh and the critical comments of B.L. Turner and Meredith Lane, though Meredith and I do not agree on the taxonomy.

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## FOUR NEW SPECIES OF *ERIGERON* (COMPOSITAE: ASTEREAE) FROM NORTHERN MÉXICO

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### ABSTRACT

Three species of *Erigeron* endemic to the Sierra Madre or immediately adjacent areas of Coahuila, Nuevo Leon and Tamaulipas of northeastern México are proposed as new: *E. scoparioides*, an anomalous species at least superficially similar to *E. filifolius* (Hook.) Nutt. of the western United States; *E. hintoniorum*, most closely related to *E. palmeri* A. Gray, a species of relatively lower elevations ranging from Oaxaca to Nuevo Leon; and *E. onofrensis*, a narrowly endemic, epappose vicariad of *E. flagellaris* A. Gray, which is widespread in the western United States and northern México. A fourth proposed new species, *E. mohinorensis* from Cerro Mohinora in southern Chihuahua, is closely related to *E. galeottii* (A. Gray ex Hemsl.) E. Greene, which occurs primarily in the trans-volcanic mountains from Veracruz to Michoacán.

KEY WORDS: *Erigeron*, Asteraceae, México, systematics.

Four new species of *Erigeron* from northern México are described below.

*Erigeron scoparioides* Nesom, sp. nov. TYPE: MÉXICO. Tamaulipas: Mpio. Bustamante, ca 1 mi NW of Hwy 101 on road toward Bustamante, 23° 18'N, 99° 40'W; area of pine-juniper with many evergreen shrubs, 1680 m, 2 Aug 1983, G. Nesom 4785 (holotype: TEX!; isotypes: ANSM!, CAS!, GH!, MEXU!, MICH!, NY!, US).

*Erigeron filifolius* (Hook.) Nutt. similis foliis filiformibus ascendentibus et gemmis strictis sed habitu rhizomatoso, caulibus nitidis glabratis vel sparsim strigosis, capitulis minoribus, corollis radii non-circinatis, et pappo uniseriato differt.

Herbaceous perennials from very slender, woody rhizomes. Stems and leaves glabrate to very sparsely strigose with appressed hairs 0.2-0.6 mm long, glandular, shiny-textured. Stems strictly erect, 12-25 cm tall, few-branched

above the very base. Basal leaves absent, the cauline densely arranged, stiffly ascending, filiform, 0.3-0.5 mm wide, mostly 8-22 mm long, little or not at all reduced in size upwards, with apex often falcate-apiculate. Heads solitary, campanulate, 6-7 mm wide (pressed), on peduncles 5-15 mm long, erect in bud; phyllaries glabrate, often with a few, minute glandular hairs, greenish with a golden-brown midvein, white lateral zones, and margins with a narrow, scarious rim, elliptic-lanceolate, 4.0-5.1 mm long, in 3-4 series, the outermost 1/3-1/2 as long as the inner. Ray flowers 16-29 in a single series, corollas white, drying white to light pink, without a midstripe, 4.5-5.0 mm long, including the tube 1.0-1.4 mm long, the ligules 0.6-1.0 mm wide, 3-4 veined, not coiling or reflexing. Disc corollas tubular-funneliform, 3.0-3.5 mm long, not indurated or inflated; style branches 0.5-0.6 mm long, including the deltate to shallowly to very shallowly triangular collecting appendages 0.1-0.2 mm long. Achenes oblong to narrowly oblong, ca 1 mm long, sparsely strigose; pappus of 17-22 persistent bristles 2.0-3.5 mm long, without an outer series.

Known only from the cited collections, which were made within a few kilometers of one another on the deeply dissected limestone plateau east of Bustamante, Tamaulipas; moist ravines, shaded by shrubs, area of pine-juniper to chaparral with *Dodonaea*, *Aloysia*, *Leucophyllum*, *Hechtia*, *Acacia*; 1650-1700 m; flowering Jun-Aug.

Additional collection examined: MÉXICO. Tamaulipas: Mpio. Bustamante, 4.8 mi NW of Hwy 101 on road toward Bustamante, 23° 25'N, 99° 40'W; small ravine at bottom of larger canyon, steep, W-facing slope overlooking deep valley, chaparral, 15 Jun 1987, *G. Nesom 5978 et al.* (CAS, CHAPA, ENCB, F, MEXU, MICH, MO, NY, RM, TEX, UAT).

*Erigeron scoparioides* can be immediately recognized by its thin, strictly erect stems, stiffly ascending, filiform leaves that are relatively even in size and unreduced from stem bottom to top, small heads with white, straight, ray corollas, and simple pappus. The stems and leaves are glabrate to very sparsely short-strigose and have a shiny-textured surface. The plants form dense masses interconnected through the system of slender rhizomes.

Because it is so strikingly different in morphology, the relationships of *Erigeron scoparioides* are difficult to discern. It is at least superficially similar to *Erigeron filifolius* (Hook.) Nutt. of the western United States, but that species is tap-rooted, not rhizomatous, and has a biseriate pappus and larger heads with coiling ligules with a strong tendency to produce blue pigments. If *Erigeron scoparioides* is related to species of México, the strictly erect buds, unusual among species of eastern México, suggest that its affinities may lie with the group that includes *E. karvinskianus* DC.

*Erigeron hintoniorum* Nesom, sp. nov. TYPE: MÉXICO. Coahuila: Mpio. Arteaga, Sierra Coahuilon, pine forest at 3300 m, 23 Jun 1985,

*Hinton et al. 18868* (holotype: TEX!).

*Erigeron palmeri* A. Gray similis sed indumento villosio, phyllariis glandulosis, et setarum pappi numero majori differt.

Perennials from short (1-3 cm long) rhizomes. Stems monocephalous, erect or usually somewhat basally ascending, 11-28 cm tall, the earliest on shorter stems 8-10 cm tall, shallowly ribbed, moderately villous, the hairs with a noticeable retrorse orientation, especially on the lower part of the stem. Leaves moderately to sparsely villous to long-strigose, often less densely so beneath; basal leaves 4-10 cm long, the blades elliptic to obovate, 6-18 mm wide, basally attenuate to a petiole equal the length of the blade, wide, hyaline and sometimes purple at the very base, margins remotely serrate with 2-5 pairs of teeth, sinuations, or shallow lobes, sometimes merely mucronulate and nearly entire, the apex mostly rounded to obtuse; cauline leaves sharply reduced in size on the lower third of the stem, very scattered above that and further reduced to lanceolate or linear-lanceolate bracts. Heads solitary, hemispheric, 13-18 mm wide (pressed), the involucre and immediately subtending peduncle densely white-villous; phyllaries linear-lanceolate to lanceolate, 7-11 mm long, in 3-5 series of equal length, usually dark purple, the apices long-attenuate, loose and with glandular to stipitate-glandular hairs in addition to the villous vestiture. Ray flowers 80-130 in 1-2 series, the corollas 13-18 mm long, the tube 2-3 mm long, sparsely pubescent with biserrate hairs, the ligules 3-4(-5) veined, 0.9-2.2 mm wide, pink to white, drying white to dark purple, without a midstripe, sometimes coiling at the tip. Disc corollas tubular-funnelform, 3.2-4.2 mm long, with erect, deltate lobes, not inflated or indurated, the tube 0.8-1.0 mm long; style branches 0.9-1.1 mm long, including the triangular to triangular-ovate collecting appendages 0.1-0.2 mm long. Achenes narrowly oblong, compressed with 2, orange nerves, mature size not observed but probably 2.5-3.0 mm long, sparsely strigose; pappus bristles ca 25-45, about the same height as the corolla, in 1 series or with a few, inconspicuous, outer setae 0.1-0.3 mm high.

Known from Nuevo Leon (Cerro Potosí) and Coahuila (Sierra Coahuilon and Sierra La Marta); open pine forests in alpine or subalpine zones, with or near *P. culminicola* or *P. hartwegii*; 3250-3700 m; flowering June-July.

Additional collections examined: MÉXICO. Coahuila: Mpio. Arteaga, Sierra del Coahuilon, 8 Sep 1985, *Hinton et al. 18907* (TEX); Mpio. Arteaga, S side of Sierra Coahuilon, 18 Jun 1985, *McDonald 1505* (TEX); Mpio. Arteaga, Sierra La Marta, S side of Cerro del Morro at the top, 17 Jun 1985, *McDonald 1458* (TEX). Nuevo Leon: Mpio. Galeana, summit of Cerro Potosí, 26 Jul 1985, *McDonald 1800* (TEX).

This is the only woolly-headed *Erigeron* known from México. It is closely related to *E. palmeri*, which occurs from Oaxaca to Nuevo Leon at elevations of 1650 to 2850 meters. *Erigeron palmeri* is common in the area of

Peña Nevada, Nuevo Leon, but grows no further north; the two species are allopatric. *Erigeron hintoniorum* and *E. palmeri* are similar in their monocephalous stems with retrorsely oriented pubescence, thickish and elliptic to obovate leaves with long petioles, white ray flowers with coiling ligules and achenes with orange ribs. The new species differs most prominently from the latter in its woolly involucre and upper stems, hairy leaves, glandular phyllaries and greater number of pappus bristles.

***Erigeron onofrensis*** Nesom, sp. nov. TYPE: MÉXICO. Nuevo Leon: Mpio. Doctor Arroyo, N of Cerro Peña Nevada on peak known locally as Picacho Onofre, open meadows with *Pinus hartwegii*, 2850 m, 27 Jul 1977, G. Nesom R582 with C. Wells - voucher for a chromosome count of  $n = 9$  pairs (holotype: US!; isotypes: ARIZ!, ASU!, ENCB!, GH!, MEXU!, NCU!, OS!, SMU!, TEX!).

*Erigeron flagellari* A. Gray arcte affinis et forsan oriundus sed foliis semper integris, phyllariis herbaceis ad bases, et pappo sine setis differt.

Annual or short-lived perennial herbs from shallow fibrous roots, a taproot, or several, slender, woody axes, producing prostrate, herbaceous, leafy stoloniferous branches up to 32 cm long, these bearing rooting plantlets at their tips. Erect stems unbranched, monocephalous, 4-16 cm tall, sparsely strigose. Leaves sparsely to moderately pubescent with appressed to ascending hairs, sparsely long-ciliate along the petiole margins; basal leaves 5-50 mm long, the blade obovate to spatulate, 2-7 mm wide, basally attenuate to a petiole about 1/3-1/2 as long as the leaf, the margins entire, the apex rounded, sometimes mucronulate; cauline leaves 4-10 on erect stems, sessile, petiolate, sharply reduced in size on the upper 1/2-1/3 of the stem, even-sized and regularly spaced on the stoloniferous branches. Heads solitary, hemispheric, 8-11 mm wide (pressed); phyllaries elliptic to lanceolate, in 3-4 equal to subequal series, the inner 4-8 mm long, the outer 2/3-3/4 as long, sparsely to moderately pubescent with spreading to loosely appressed hairs, densely and minutely punctate-glandular. Ray flowers 40-80 in 1-2 series, the corollas white to light lavender or with a lavender midstripe below, drying the same, 3-4 veined, 6-10 mm long, the tube 0.9-1.6 mm long, sparsely pubescent with glandular-biseriate and non-glandular hairs, the ligule 0.7-1.2 mm wide. Disc corollas narrowly funnellform, 2.0-2.5 mm long, the lower 1/4 constricted, slightly indurated just above the constriction; style branches 0.4-0.6 mm long, including the shallowly to very shallowly triangular collecting appendages 0.1 mm long. Achenes compressed, oblong-obovate, 1.0-1.4 mm long, tan with two, thin, orange ribs, sparsely strigose; pappus of ray and disc a low, fimbriate crown or series of lacinate scales sometimes basally fused to form a crown, ca 0.1-0.2 mm high. Chromosome number,  $n = 9$  pairs.

Known only from the area of Cerro Peña Nevada on the border between Nuevo Leon and Tamaulipas; with pines in upper subalpine to alpine meadows, where the plants of this species form almost continuous mats over large areas, also in clearings among aspens and firs, or less commonly oaks, at lower elevations in deep arroyos; 2800-3600 m; flowering Jun-Sep(-Oct).

Additional collections examined: MÉXICO. Nuevo Leon: Mpio. Doctor Arroyo, [at or near type locality]: 4 Jul 1959, *Beaman 2697* (DUKE, ENCB, GH, TEX, UC, US); 5 Jul 1985, *McDonald 1648* (TEX-2 sheets); 25 Jun 1978, *Rzedowski 17390* (TEX); Mpio. Zaragoza, near Rancho La Encantada [ca 5 km NE of Peña Nevada], 4 Jul 1988, *Patterson 5840* (TEX). Tamaulipas: Mpio. Miquihuana, E and S slopes of Peña Nevada, 19 Jul 1949, *Stanford et al.*, 2598 (GH, MICH, MO, NY, SMU, UC).

Cytological material of *Erigeron onofrensis* was collected by Beaman in 1959 and a count of  $n = 8$  was published for it (Turner et al. 1961). The plants were identified in that publication as *Astranthium zanthocomoides* (Less.) Larsen, but DeJong & Longpre (1963) later referred them to *Achaetogeron* and suggested that a recount was in order, since the base number for *Achaetogeron* was known to be  $n = 9$ . The count noted above for the type collection showed nine bivalents with no irregularities at late prophase and metaphase of the first meiotic division.

*Erigeron onofrensis* appears to be an epappose vicariad and occurs on the southeastern-most edge of the range of *E. flagellaris* A. Gray, a widespread species of the western cordillera that occurs from British Columbia to Arizona and New Mexico and south to central México and east to northeastern México. The latter is known in the eastern Sierra Madre as far south as Cerro Potosí, Nuevo Leon. Both species produce mostly monocephalous, erect stems and herbaceous stolons that root at the tips and are similar in most other characters as well. *Erigeron onofrensis*, however, completely lacks pappus bristles, although an outer series of pappus scales is present. It also has rays in 2-3 series (vs 1-2), strictly entire leaves (vs entire to lobed), stem pubescence variably appressed to spreading (vs appressed) and phyllaries herbaceous from base to apex (vs basally indurated). The stoloniferous habit has been evolved independently in other species of *Erigeron* (*E. guatemalensis* (Blake) Nesom, *E. forreri* E. Greene, *E. fundus* Nesom), but the morphological similarities between *E. onofrensis* and *E. flagellaris* strongly argue that they are sister taxa. Further, a preliminary chromatographic study of leaf compounds showed that they have almost identical spot profiles of compounds assumed to be flavonoids or simple phenolics (Nesom, unpublished).

*Erigeron mohinorensis* Nesom, sp. nov. TYPE: MÉXICO. Chihuahua: Mpio. Guadalupe y Calvo, N side of Cerro Mohinora, ca 13 mi SW of Guadalupe y Calvo, 25° 57'N, 107° 03'W; open, pine-fir woods with scattered spruce, barely into flower, 20 Aug 1988, *G. Nesom 6448* with

A. McDonald (holotype: TEX!; isotypes: ARIZ!, MEXU!, NY!, US!).

*Erigeron galeottii* (A. Gray ex Hemsley) E. Greene similis et arcte affinis sed foliis basalibus spathulatis marginibus integris, foliis caulinarum amplectentibus basaliter ampliatus, phyllariis sine cristis basalibus, et flosculis radii 110-175(-230) vs 35-80 (-115) differt.

Herbaceous perennials from fibrous roots, producing short offsets or rhizomes 1-3 cm long. Stems basally ascending, 9-15(-30) cm tall, simple or with a single branch on the upper half, moderately hispid-pilose, the hairs sometimes deflexed, eglandular. Leaves strigose-pilose, the basal [usually] persistent in a rosette, spatulate, 15-50 mm long, the blades obovate to widely obovate, 6-19 mm wide, basally attenuate to a petiole 1/3(-1/2) the leaf length, margins entire or very rarely with one or a pair of distal teeth; cauline leaves oblong to oblong-lanceolate, clasping, often basally amplate, 10-31 mm long, relatively even-sized upwards. Heads solitary on peduncles 1-5 cm long, hemispheric, 10-13 mm wide (pressed), the buds erect; phyllaries linear-lanceolate, 5.0-6.5 mm long, in 3-4 series of nearly equal length or the outer usually the longest, hispid-pilose, minutely glandular at least on the distal third, greenish with purple tips, the outer mostly without scarious margins. Ray flowers 110-175(-230) in 2-3 series, corollas white, drying white, 10-13 mm long, including the tube 1.0-1.5 mm long, the ligules 0.7-1.0 mm wide, 3-4(-5) veined, the apices coiling at maturity, the tube pubescent with jointed, uniseriate hairs and bulbous-tipped, biseriate hairs. Disc corollas tubular-funnelform, 2.0-2.4 mm long, not indurated or inflated; style branches 0.6-0.7 mm long, including the deltate to triangular collecting appendages 0.1-0.2 mm long. Achenes oblong, mature size not observed, sparsely strigose, compressed, 2-nerved; pappus a crown of separate, linear-lanceolate scales 0.1 mm high, without bristles.

Endemic to the summit and immediately surrounding area of Cerro Mohinora of southern Chihuahua; abundant in open, pine-fir woods with scattered spruce; 2900-3100 m; flowering August-November.

Additional collections examined: MÉXICO. Chihuahua: [Type locality]: 16-17 Oct 1959, Correll & Gentry 23151 (LL); 27 Aug 1987, McDonald & Martínez 2371 (TEX).

*Erigeron mohinorensis* is closely related to *Erigeron galeottii* (A. Gray ex Hemsley) E. Greene, the common, high-elevation, white-rayed *Erigeron* of the trans-volcanic ranges from Veracruz to Michoacán. A disjunct population system of *E. galeottii* occurs in the Sierra de Oaxaca and another, noted below, in northwestern Chihuahua. Both species are members of a group of species characterized by erect buds, white, coiling ray corollas and achenes without pappus bristles or, if present, the bristles are very short and appear sporadically in few individuals. *Erigeron mohinorensis* and *E. galeottii*

are distinguished from related species by their perennial, somewhat caespitose habit with short basal offsets or rhizomes, herbaceous phyllaries with purple tips and hispid-pilose vestiture, and coroniform pappus of basally fused, minute setae or scales 0.1 mm high.

In an earlier study (Nesom 1980), I included the Mohinora plants (based on the single Correll & Gentry sheet cited above) with *E. galeottii*, but with more collections available and after a chance to observe them in the field, I believe they should be separated as in the following couplet.

1. Basal leaves spatulate, the blades widely ovate to obovate, the petiole  $1/3(-1/2)$  the leaf length, margins entire or very rarely with one or a pair of teeth distally; cauline leaves oblong, often basally ampliate, clasping; phyllaries without basal ridges; ray flowers  
110-175(-230) ..... *E. mohinorensis*
1. Basal leaves with elliptic-lanceolate to -oblanceolate blades, the petiole  $1/3-2/3$  the leaf length, margins serrate with 2-8(-11) pairs of teeth or prominent mucros; cauline leaves lanceolate to oblanceolate, not basally ampliate or clasping; phyllaries with a pair of whitish, longitudinal ridges on the lower third; ray flowers 35-80(-115) ..... *E. galeottii*

Three collections from northwestern Chihuahua, separated from the closest population of the same species in Michoacán by more than 1300 km, appear to be typical *Erigeron galeottii*: Chuhuichupa, Aug-Sep 1936, *LeSueur 967* (GH,LL,MO,TEX,UC); near Colonia Garcia, 1-20 Aug 1899, *Nelson 6170* (GH,US); near Colonia Garcia, 29 Jul 1899, *Townsend & Barber 188* (GH,MEXU,MO,NMC,NY-2 sheets,TEX,UC,US). The few plants of these relatively old collections, however, are without basal leaves and appear to be single-stemmed from long, solitary rhizomes. They may represent a different taxon, but more observations are needed before they can be properly evaluated.

#### ACKNOWLEDGMENTS

I thank Drs. B.L. Turner and A. McDonald for their comments on the manuscript and the herbaria cited for loans of specimens.



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NEW SPECIES OF *LASIANTHAEA*, *VERBESINA* AND  
*WEDELIA* (ASTERACEAE) FROM SIERRA  
SUROTATO, NORTHERN SINALOA

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ABSTRACT

Three new species are described, one each in the genera *Lasianthaea*, *Verbesina* and *Wedelia*. In addition, a clarification of a previously published species is included.

KEY WORDS: Asteraceae, México, systematics.

Recent collections of unidentified material at the University of Arizona (ARIZ) made by H.S. Gentry in the Sierra Surotatos of northern Sinaloa have revealed the following novelties.

*Lasianthaea gentryi* B. Turner, sp. nov. Figure 1. TYPE: MÉXICO. Sinaloa: Sierra Surotato, Quebrado de Mansana, pine-oak forests, 4000-5000 ft, steep moist canyon slopes, northern exposures, 10-14 Sep 1941, H.S. Gentry 6464 (holotype: ARIZ!).

*Lasianthaea fruticosae* (L.) K. Becker similis sed foliis majoribus tenuibus et pedunculis valde pubescentibus trichomatibus fulvis patentibus multiseptatis 1.5-2.0 mm longis differt.

Shrubs 2-3 m high with slender spreading branches. Stems sparsely hispidulous. Leaves opposite, 10-20 cm long, 3-6 cm wide; petioles 6-15 mm long; blades thin, ovate, gradually tapering upon the petioles, with 3-5 principal nerves which arise 1-3 cm above the base, sparsely to moderately hispid above and below, those of the upper surface broad based, the margins serrulate. Heads 5-15 in fasciculate terminal clusters, these over-topped by the adjacent leaves, the peduncles 1-2 cm long, markedly pubescent with tawny multiseptate spreading trichomes, 1.5-2.0 mm long. Involucres campanulate, 6-8 mm high, 5-6 mm wide, the bracts subequal, lanceolate (outermost) to broadly ovate, hispidulous on the faces and marginally ciliate. Ray florets 8-11, pistillate, fertile, the ligules yellow, 6-8 mm long. Disk florets 20-30, the corollas yellow, 5-6 mm long, glabrous except for the sparsely hispidulous lobes. Achenes (those of the disk) ca 3 mm long, 1.5 mm wide, narrowly

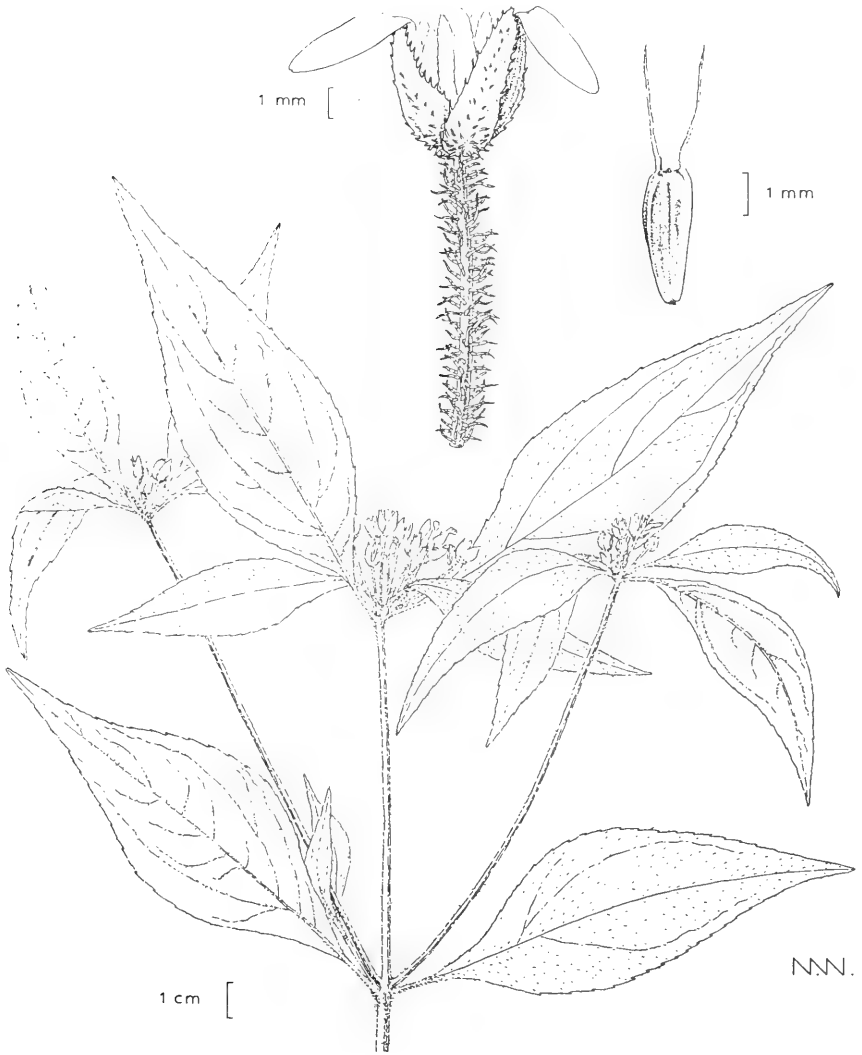


Fig. 1 *Lasiantha gentryi*, from holotype.

winged on the abaxial surface, the pappus of 1 or 2 slender awns 3-4 mm long.

A very distinct taxon, closely related to *Lasianthaea fruticosa* (L.) K. Becker but easily distinguished by its remarkable tawny-hirsute pubescence, unlike that found in any of the several varieties within that species, as recognized by Becker (1979). Figure 2 shows the distribution of the varieties of *L. fruticosa*, sensu Becker; the location of *L. gentryi* is shown by an asterisk. It might have been equally reasonable to treat the latter as but a localized variety of *L. fruticosa*, but it is strikingly different from all of the presently known varieties. While probably closest to the var. *fasciculata* (DC.) K. Becker, the latter shows no signs of intergradation with it.

***Verbesina sinaloensis*** B. Turner, sp. nov. TYPE: MÉXICO. Sinaloa: "Sierra Monterey, shady canyon bottom with oaks, pines, palms and running water," 5000 ft, 10 Mar 1940, *H.S. Gentry 5875* (holotype: ARIZ!; isotype: GH!).

Differt a *Verbesina grayi* (Seem.) Hemsl. foliis angustioribus lineari-lanceolatis petiolis brevioribus, corollis radii longioribus, et flosculis disci numerosioribus.

Shrubs 1-2 m high. Stems purplish, minutely puberulent. Leaves opposite or ternate below, alternate near the capitulescence, 6-15 cm long, 0.8-1.5 cm wide; petioles 1-5 mm long; blades linear-lanceolate, pinnately nervate, roughly hispidulous-pilose above, appressed silky-sericeous beneath, the margins rather evenly serrulate. Heads 3-5 in terminal or subterminal clusters, the ultimate peduncles 2.5-4.0 cm long. Involucres campanulate, 7-9 mm high, 4-5 seriate, the bracts pale yellow and markedly gradate, scarious with narrowly acute apices, these grading into remarkably similar receptacular bracts. Ray florets 11-13, pistillate, fertile, the tube ca 3 mm long, pubescent the ligules yellow, 10-12 mm long, ca 3 mm wide. Disk florets 50 or more, the corollas yellow, ca 5.5 mm long, the tube ca 1.5 mm long, pubescent. Ray achenes ca 3 mm long, plump, clavate, black, glabrous, wingless, epappose. Disk achenes (immature) radially flattened, pubescent, the pappus of 2 slender deciduous awns ca 2 mm long.

Additional collections examined: MÉXICO. Sinaloa: Sierra Surotato, Los Pucheros, "Pine-oak madroño; moist soil in rocks, canyon," 5500-6500 ft, 17-24 Mar 1945, *H.S. Gentry 7193* (GH,US).

*Verbesina sinaloensis* is closely related to *V. grayi* (Seem.) Hemsl. of northern Durango and Nayarit southwards, which would include both *V. discoidea* (Brandege) Rzed. and *V. heterocarpa* Blake by my reckoning. Rzedowski (1980) treated the latter two species as synonymous, but failed to recognize their relationship to *V. grayi*. McVaugh (1984), however, recognized *V. heterocarpa* without reference to Rzedowski's publication, nor does he mention *V. grayi*. The present species differs from *V. grayi* in its mostly

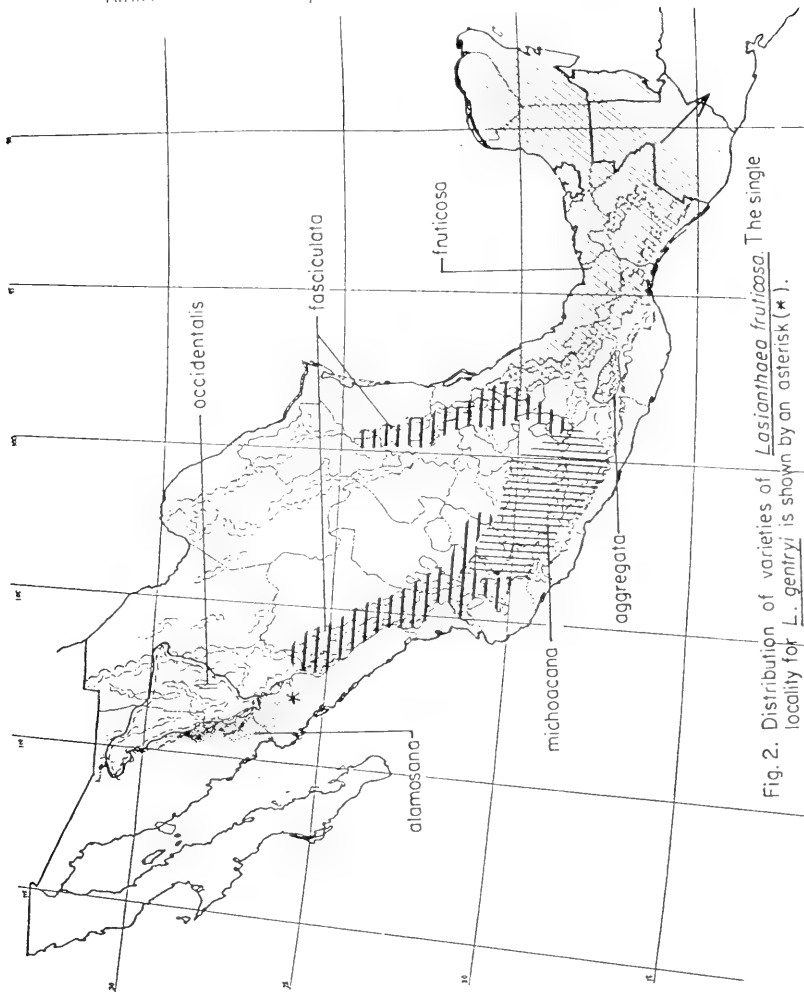


Fig. 2. Distribution of varieties of *Lasianthaea fruticosa*. The single locality for *L. gentryi* is shown by an asterisk (\*).

straw colored, scarious, 4-5 seriate, strongly gradate involucre bracts, more numerous disk florets (50+), longer, well developed, rays (11-15 mm long vs 1-8 mm long or absent) and more narrowly lanceolate to lanceolate-elliptic leaves which are softly appressed-pilose beneath.

According to H.S. Gentry (pers. comm.), Sierra Monterey is part of the Sierra Surotatos.

*Wedelia gentryi* B. Turner, sp. nov. TYPE: MÉXICO. Sinaloa: Sierra Surotato, Ocurahui, "rolling open valley with argillaceous soils," 6000-7000 ft, 1-10 Sep 1941, H.S. Gentry 6289 (holotype: ARIZ!; isotypes: ARIZ!, TEX!).

*Wedelia chihuahuanae* B. Turner similis sed foliis majoribus lanceolati-ovatis et capitulis 2-5 aggregatis in pedunculis ultimis plerumque 1-3 cm longis differt.

Suffruticose perennial herbs, said to be a "decumbent ... bush, dense about base." Stems tan, terete, harshly hispidulous. Leaves opposite throughout, 6-12 cm long, 1-2 cm wide; petioles 0.5-1.0 cm long; blades lanceolate, tapering upon the petioles, trinervate from above the base, sparsely appressed hispid on both surfaces, especially along the veins beneath, uncinuate hairs absent, the margins remotely serrulate. Heads terminal or subterminal in clusters of 2 to 5, the ultimate peduncles 0-3 cm long (the earliest head, if single, rarely on peduncles to 8 cm long). Involucres 9-10 mm high, the bracts 2-3 seriate, subequal, the outermost ovate-lanceolate with acute green apices, the innermost elliptic-ovate, somewhat scarious with ciliate margins. Receptacular bracts purple keeled, shorter than the subtended florets. Ray florets ca 8, neuter, sterile, the tubes ca 3 mm long, the ligules 7-9 mm long. Disk florets 15-25, the corollas yellow, ca 6 mm long. Achenes (immature) ca 2 mm long, pubescent, the pappus a crown of erose scales ca 0.5 mm high.

The species is presumably closely related to the recently described *Wedelia chihuahuana* B. Turner (1988; cf comments below) having the decumbent habit, round stems and vestiture of that taxon, but differing in its longer, narrower, lanceolate-ovate leaves and heads in clusters of 2-5 on much shorter peduncles (mostly 1-3 cm long vs 3-8 cm).

*Wedelia chihuahuana* B. Turner, Phytologia 65:349. 1988.

Emended description: *Wedelia hispida* H.B.K. similis sed caulibus laxis ut videtur procumbentibus et capitulis 1-3 in pedunculis 2-8 cm longis differt.

In my recent description of this species (Turner 1988), I erred in making formal comparison to an unpublished (and unnecessary) combination *Wedelia tezana* (A. Gray) B. Turner. At the time of my original description, I intended to make the latter combination, but subsequently concluded that this was

synonymous with *W. hispida*. Unfortunately, I forgot to substitute the name *W. hispida* H.B.K. for *W. tezana* (A. Gray) B. Turner in my diagnosis. So as to avoid any confusion, I republish *W. chihuahuana* with reference in my diagnosis to a previously and validly published name.

#### ACKNOWLEDGMENTS

I am grateful to Dr. Charles Mason, Director (ARIZ), for the loan of materials and to Dr. Guy Nesom and Dr. Andrew McDonald for reviewing the manuscript. Guy Nesom provided the Latin diagnoses and Nancy Webber provided the illustration of *Lasianthaea gentryi*.

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**VIGUIERA ILTISII (ASTERACEAE, HELIANTHEAE)  
A NEW SPECIES FROM JALISCO, MÉXICO**

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ABSTRACT

*Viguiera iltisii* B. Turner, a new species from Jalisco, México, is described. It belongs to the subgenus *Amphilepis* where it relates to *V. flava*.

KEY WORDS: *Viguiera*, Asteraceae, México, systematics.

Routine identification of Mexican Asteraceae from WIS has revealed the following novelty:

*Viguiera iltisii* B. Turner, sp. nov. TYPE: MÉXICO. Jalisco: 0.5 km S of Puerto San Pedro (19° 20'N, 103° 23'W) open pine-oak forests, 1300-1400 m, 31 Jul 1960, *Hugh H. Iltis, R. Koepfen & F. Iltis 612* (holotype TEX!; isotypes WIS-3 sheets!).

*Viguiera flavae* (Hemsl.) S.F. Blake similis sed plantis caulibus longioribus internodis multo longioribus, foliis majoribus ovatis vel ovati-ellipticis, et pedunculis multo longioribus 10-30 cm longis differt.

Perennial herbs with prostrate stems up to 1 m long, the stems 1-5, arising from an enlarged woody rootstock, the latter 3-6 cm long, 2-4 cm across. Stems hispidulous with remote nodes, the latter mostly 2-3 times as long as the leaves. Leaves opposite throughout, ovate to ovate-elliptic, mostly 4-8 cm long, 2.5-4.0 cm wide; petioles mostly 3-12 mm long; blades 3-nervate from near the base, hispidulous on both surfaces, the margins irregularly serrate. Heads hemispheric, 5-6 cm across the expanded rays, solitary and terminal on elongate peduncles 6-32 cm long. Involucres 12-13 mm high, 3-seriate, the bracts ovate-elliptic, coarsely pubescent, the outer series mostly 8-9 mm long, the inner series mostly 12-13 mm long with obtuse or rounded apices, the margins coarsely ciliate. Receptacle convex, paleate, the pales acute. Ray florets ca 21, neuter, sterile, the ligules yellow, 25-30 mm long, 8-10 mm wide. Disk florets numerous, the corollas yellow, 5.5-6.0 mm long, the tubes ca 2 mm long, glandular-hispid, the lobes ca 1 mm long. Achenes (immature) ca 2.5 mm long, glabrous, epappose.



The species apparently belongs to the subgenus *Amphilepis* of *Viguiera* near *V. fláva* (Hemsl.) Blake. It is readily distinguished from the latter by its much longer, prostrate, stems with very long internodes and much broader, ovate to ovate-elliptic, leaves and much longer peduncles. *Viguiera iltisii* will key to *V. hypochlora* (S.F. Blake) S.F. Blake in McVaugh's (1984) treatment of the Jaliscan Compositae, but that taxon is an erect suffruticose herb or shrub to 3 m high with yet other features which mark it as distinct from the present species.

It is a pleasure to name this species for its principal collector, Prof. Hugh Iltis, of the University of Wisconsin, long-time friend and exceptional systematist, whose interest in the Mexican flora is of long standing. The fact that the main body of this plant is mostly prone had little or nothing to do with the eponym selected.

#### ACKNOWLEDGMENTS

I am grateful to Dr. Guy Nesom for the Latin diagnosis and for other suggestions, to Dr. Iltis for the large loan of specimens from WIS and to Dr. Andrew McDonald for review of the manuscript.

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## NEW SPECIES AND COMBINATIONS IN *PERITYLE* (ASTERACEAE) FROM NORTHWESTERN MÉXICO

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### ABSTRACT

*Perityle vandevenderi* B. Turner, a new species from near Magdalena, Sonora, is described and a new combination, *P. scopulorum* (M.E. Jones) A.M. Powell & B. Turner, is proposed; both belong to the section *Laphamia*.

KEY WORDS: *Perityle*, Asteraceae, México, systematics.

Examination of unidentified collections of *Perityle* at ARIZ, in connection with a treatment of *Perityle* for México, has revealed a new species and the necessity for a new combination, as noted below.

*Perityle vandevenderi* B. Turner, sp. nov. TYPE: MÉXICO. Sonora: Palm Canyon, 17 mi SE of Magdalena on road to Cucurpe, "Sierra Bavisó," 6 Sep 1976, *N.F. McCarten 2315*, with Tom Van Devender (holotype: ARIZ!; isotype: ARIZ!).

*Perityle dissectae* (A. Gray) A. Gray similis sed vestimento omnino albitomentoso, capitulis fere sessilibus, et acheniis sine pappo differt.

Suffruticose, low, perennial, white-tomentose herbs 6-15 cm high. Stems pubescent with white, lanose hairs. Leaves opposite, tomentulose, 10-16 mm long, 6-11 mm wide; petioles 5-10 mm long; blades deeply 3-parted, the principal divisions once- or twice dissected, the ultimate divisions 0.5-3.0 mm long. Heads eradiate, single on short terminal peduncles 1-5 mm long. Involucres 6-7 mm long, the bracts subequal, densely to sparsely white lanate with matted hairs. Ray florets absent. Disk florets 20-30, the corollas yellow, ca 5 mm long, the tube densely glandular pubescent, ca 1.5 mm long, the throat tubular, ca 3.5 mm long. Achenes oblanceolate, ca 4 mm long, 1 mm wide, the faces densely hispidulous, the margins with a well developed, eciliate, callose rim; pappus absent.

Additional specimens examined: MÉXICO. Sonora: Palm Canyon, Sierra Bavisó, 18 mi E Magdalena, 14 Oct 1979, *J. Kaiser s.n.* (ARIZ); "west face

of Sierra Babiso," just N of Palm Canyon, ca 1100 m, 11 Oct 1987, M.R. Johnson 87-003 (ARIZ).

A very distinct species, clearly belonging to the sect. *Laphamia* of *Perityle* where it relates to *P. dissecta*, as noted in the above diagnosis. It is a pleasure to name this very distinct species for Dr. Tom Van Devender of the Arizona-Sonora Desert Museum, Tucson, Arizona, who has been associated with an ecological-floristic study of the Sierra Babiso, Sonora, since its inception and was with the original party that collected the type material. He is well known for his study of rat middens in the southwestern U.S.A. and adjacent México, especially as these might relate to climatic shifts. He notes (pers. comm.) that the mountain range is actually called Cerro Cinta de Plata on topographic maps and that the locals call Palm Canyon "Cañon del Diablo." He further notes that *Perityle vandevenderi* occurs "about a half mile below the mouth of the palm canyon in the main canyon. In this area a stream becomes perennial and cottonwood-willow riparian trees begin and the canyon narrows and turns. The grey *Perityle* were uncommon, growing on a very large boulder/cliff face on the side of the canyon bed in a deep shady area with abundant *Tillandsia recurvata*. The rock is volcanic ash."

*Perityle scopulorum* (M.E. Jones A.M. Powell & B. Turner, comb. nov.

Based upon *Laphamia scopulorum* M.E. Jones, Contr. Western Bot. 12:48. 1908.

Rydberg (N. Amer. Fl. 34:19. 1914) placed *Laphamia scopulorum* as questionably synonymous with *Perityle coronopifolia* A. Gray, a rather common species of southernmost Arizona and New Mexico. So far as known, it has not been collected in México. Blake (Contr. U.S. Natl. Herb. 29:134. 1945) took *P. scopulorum* to be a good species belonging to the sect. *Laphamia*, which he recognized as a distinct genus. Powell (1974), after examination of fragmentary type material from Colonia Juarez, Chihuahua (the only specimen known to both Powell and Blake), followed Rydberg in retaining this as a questionable synonym of *P. coronopifolia*. Dr. Powell and I have examined an additional recent collection from the vicinity of the type locality (26 km by winding road NW of Colonia Juarez in the "Tinaja," a canyon through the foothills of this region, 1750 m, 28 Jul 1972, Wilson & Johnston 8480 LL) and conclude that Jones and Blake were correct in their evaluation and thus make the necessary transfer to *Perityle*.

#### ACKNOWLEDGMENTS

I am grateful to Dr. Chales Mason (ARIZ) for the loan of specimens, to Dr. Tom Van Devender for information regarding the type locale, to Dr.

A.M. Powell (SRSC) for information relating to *P. scopulorum*, to Dr. Guy Nesom for the Latin diagnosis and a review of the manuscript itself, and Dr. Andrew McDonald for review of the manuscript.

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