

## TAXONOMY OF THE GENUS *LAENNECIA* (ASTERACEAE: ASTEREAEE)

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### ABSTRACT

A group of 15 Mexican and South American species that have been regarded as *Conyza* are transferred to the genus *Laennecia*, which is divided into two sections, sect. *Laennecia* and sect. *Sophiifolium* Nesom. The species of *Laennecia* are generally characterized by phyllaries with a single midvein that is greenish rather than orange resinous, deeply lobed disc corollas and the presence of achenial glands. Most of the species also have herbage with a resinous glandular, woolly vestiture. Three species are already identified as *Laennecia*: *L. filaginoides* DC, *L. gnaphalioides* (Kunth) Cass. (the generitype) and *L. pimana* Nesom & Laferrière. Nomenclatural transfers for the remainder are proposed here: *L. altoandina* (Cabrera) Nesom, *L. artemisiifolia* (Meyen & Walp.) Nesom, *L. confusa* (Cronq.) Nesom, *L. coulteri* (A. Gray) Nesom, *L. eriophylla* (A. Gray) Nesom, *L. lasseriana* (Aristeg.) Nesom, *L. microglossa* (S.F Blake) Nesom, *L. mimia* (S.F. Blake) Nesom, *L. prolialba* (Cuatr.) Nesom, *L. schiedeana* (Less.) Nesom and *L. sophiifolia* (Kunth) Nesom. In addition, a new species from Chihuahua, México, is described as *L. chihuahuana* Nesom. An hypothesis of infrageneric phylogeny is presented, based on a cladistic analysis. The generic relationships of *Laennecia* are not clear, but it may be more closely related to the Old World genus *Nidorella* or even members of the subtribe Grangeinae than to true *Conyza* and *Erigeron*.

KEY WORDS: *Conyza*, *Laennecia*, Astereae, Asteraceae, México.

Zardini (1981) proposed that Cassini's genus *Laennecia* be reseggregated from *Conyza* with two species, *L. filaginoides* DC. and *L. gnaphalioides* (Kunth) Cass (the generitype). She separated *Laennecia* and *Conyza* by the following key (translated).

1. Plants generally not woolly; achenes with duplex trichomes very sparse; pappus uniseriate ..... *Conyza*
- 1' Plants woolly; achenes with duplex trichomes dense or covering only the central part and margins; pappus biseriate ..... *Laennecia*

Using the same criteria, Cuatrecasas (1969) previously recognized the two species as *Conyza* sect. *Laennecia* (Cass.) Cuatr. I agree that two groups exist within American *Conyza* as that genus is now generally perceived and that these criteria point in the right direction for their recognition. Most of the species that correctly belong in *Laennecia*, however, are eliminated by adherence to Cuatrecasas' and Zardini's strict concept of the group. Instead, there appears to be a monophyletic group of not two, but 15 species centered around *L. flaginoides*. The number of pappus series (1 or 2) in these species is variable, as is the arrangement of achenial pubescence (dense to completely lacking) and even the woolly vestiture. These species are interrelated in discernible patterns among themselves, however, and distinguished as a group from true *Conyza* by a combination of characters as presented in the following couplet.

1. Plants variously pubescent but not woolly; glands, if present, stipitate and not resin tipped; phyllaries 3 veined except in smallest heads, at least the midvein strongly orange resinous; disc corollas strongly orange veined, with shallow, deltate lobes cut 1/5-1/8 to the base of the limb; achenes eglandular, sparsely strigose to glabrate; pappus uniseriate . . . . *Conyza*
  
- 1' Plants woolly, less commonly hirsute-pilose; short stipitate glands at least on the leaves of most species, these developing prominent, orange resinous heads; phyllaries with a green midregion, the single, thin midvein sometimes yellowish but not orange resinous; disc corollas light veined, not orange, with lanceolate lobes cut 1/2-3/4 to the base of the limb; achenes usually glandular, sometimes eglandular, densely sericeous to strigose or glabrous; pappus uniseriate or strongly biseriate . . . . . *Laennecia*

*Laennecia* and *Conyza* have been regarded as congeneric on the basis of their joint possession of eligulate or short ligulate pistillate flowers in numerous series and their achenes with pappus bristles that elongate at fruit maturity. Based on the evidence presented here, however, these similarities probably should be interpreted as the results of parallel or convergent evolution, because *Laennecia* can be recognized as a clearly delimited lineage separate from *Conyza* and perhaps not particularly closely related to it.

The orange resinous midveins of the phyllaries, which are invariably present in *Conyza* and *Erigeron* (Nesom 1990), are absent in *Laennecia*. This difference is so strong that an individual of the latter can be separated from *Conyza* on the basis of no more than a single phyllary. The same is true for the striking difference in the morphology of the disc corollas. The deeply lobed, often goblet shaped corollas of *Laennecia* are more similar to those of *Baccharis* and other South American genera of Astereae in this respect than they are to those of *Conyza* and most North American genera.

Among the distinctive features of *Laennecia*, the glandularity does not occur in any species of *Conyza*, at least as the genus is understood in the New World. Stipitate glandular hairs occur commonly on the vegetative parts of *Erigeron* (e.g., *E. oreophilus* Greenm. and many other species) and rarely on *Conyza* (e.g., *C. coronopifolia* Kunth) but the glands of *Laennecia* with a head of yellowish orange, transparent resin is different from anything seen in either of those genera. All of the glands are "Type C" trichomes (Nesom 1976), which apparently are common throughout the tribe, but in *Laennecia* they produce the extra "head" of translucent resin. The same is true of the achenes, where late in their ontogeny, the glands of the more advanced species of *Laennecia* develop particularly large, resinous heads.

To my knowledge, glandular achenes occur in only a few species of other North American genera of Astereae. None are found in *Conyza* or in the large genus *Erigeron*, which is considered to be closely related to *Conyza*. They do occur in a few species of *Aster* and *Chrysothamnus* and in at least one species of *Haplopappus* sect. *Macronema*.

Glandular achenes are characteristic of genera of the subtribe Grangeinae, and it is possible that the recent evolutionary ancestry of *Laennecia* is more closely linked to that group than with *Conyza*. As pointed out by De Jong (1965), plants of the Grangeinae also tend to produce tubular, often eligulate pistillate flowers in several series. *Laennecia* is excluded from the strictly defined Grangeinae of Fayed (1979), however, as well as a more broadly defined subtribe, because of its pappus of barbellate bristles. Almost all of the American genera of Grangeinae centered around *Lagenophora* (Cabrera 1966) have epappose or bristleless achenes. On the other hand, significant variation in the nature of the pappus is known to occur even within many genera of Astereae and the lack of bristles probably should not be disproportionately weighted in the definition of the Grangeinae. In fact, the monotypic *Floscaldasia* of South America, accepted by Grau (1977) in the Grangeinae, has 1-2 series of numerous pappus setae that are as long as the disc corollas.

Alternatively, a possible relationship between *Laennecia* and the Old World genus *Nidorella* should be investigated in more detail. *Conyza* in the Old World appears to be polyphyletic and includes species that probably are most closely related to species of *Nidorella* (Nesom 1990). Achenes of *Nidorella* are glandular, but on the other hand, the disc corollas of those species are also glandular and are deltate, features not characteristic of *Laennecia*.

*Laennecia* Cass., Dict. Sci. Nat. 25:91. 1822. Type species: *Conyza gnaphaloides* Kunth. *Conyza* sect. *Laennecia* (Cass.) Cuatr., *Webbia* 24:206 1969. Not *Conyza* sect. *Laennecia* (Cass.) Cuatr., *Phytologia* 9:1. 1963 (*comb. illeg.*).

Taprooted annuals, biennials, or short lived perennials (fibrous rooted in *L. confusa* [Cronq.] Nesom). Leaves, stems and phyllaries white tomentose

or cottony, coarsely hairy in 2 species, glandular with sessile, translucent, orange-yellow, resin glands, eglandular in 4 species. Leaves alternate, toothed to pinnately lobed, rarely entire, sessile, clasping or nonclasping. Heads in spicate or racemose to loosely panicate or corymbose capitulescences; buds erect. Pistillate flowers numerous in several series, fertile, white, filiform-tubular, eligulate and apically fimbriate, much shorter than the style, or some species with a ligule 0.2-2.5 mm long. Hermaphroditic (disc) flowers fertile, cream to yellowish, narrowly tubular-funnelform, ampliate near the origin of the lobes, the lobes triangular-lanceolate, 1/2-3/4 the total length of the limb (longer than the throat), eglandular but usually with a few, viscid, clavate hairs on the limb; style branch appendages deltate to narrowly triangular. Achenes compressed, narrowly oblanceolate-elliptic to obovate in outline, with sessile resin glands on the faces, rarely eglandular, minutely and sparsely short stipitate glandular in sect. *Sophiifolium* Nesom; pappus uniseriate or biseriate, a series of slender barbellate, often easily caducous bristles, usually elongating at maturity past the disc corollas and involucre, with or without an outer series of much shorter setae, bristles, or scales. Base chromosome number,  $x=9$ .

*Laennecia* is restricted to the New World, where its species occur primarily in montane habitats or at least in temperate highlands rather than tropical habitats. Population systems within several of the species are widely disjunct: *L. gnaphalioides*, *L. flaginoides* and *L. sophiifolia* (Kunth) Nesom between North/Central America and South America; *L. schiedeana* (Less.) Nesom and *L. confusa* between west to northwest México, and south central México/Central America.

The genus is formally divided into two sections. The rationale for this partition is presented below in connection with the phylogenetic analysis.

*Laennecia* sect. *Laennecia*.

Leaves mostly oblong-lanceolate, toothed, glandular or eglandular, herbage glandular or eglandular, with densely white tomentose vestiture. Achenes with large, sessile, persistent resin glands, eglandular in one species.

Species included: *Laennecia chihuahuana* Nesom, *L. confusa*, *L. eriophylla* (A. Gray) Nesom, *L. flaginoides*, *L. gnaphalioides*, *L. lasseriana* (Aristeg.) Nesom, *L. microglossa* (S.F. Blake) Nesom, *L. mima* (S.F. Blake) Nesom, *L. pimana* Nesom & Laferrière, *L. prolialba* (Cuatr.) Nesom and *L. schiedeana*.

**Laennecia** sect. **Sophiifolium** Nesom, *sect. nov.* Type species: *Conyza sophiifolia* Kunth, *Nov. Gen. & Sp.* 4[folio]:56. 1818; 4[quarto]:72, pl. 326. 1820.

Folia pinnatifida vel bipinnatifida (in *Laennecia coulteri* plerumque dentata), glandulosa, vestimento hirsuti-piloso. Achenia glandibus parvis parum elevatis deciduis.

Leaves mostly pinnatifid to bipinnatifid (toothed in *Laennecia coulteri*), glandular, with hirsute-pilose vestiture. Achenes with small, sometimes slightly raised, apparently deciduous glands.

Species included: *Laennecia altoandina* (Cabrera) Nesom, *L. artemisiifolia* (Meyen & Walp.) Nesom, *L. sophiifolia* and provisionally, *L. coulteri* (A. Gray) Nesom (see comments below).

### SPECIES RELATIONSHIPS

The genus was analyzed cladistically (Wagner parsimony of PAUP: Swoford 1985) using 14 characters that could be unequivocally scored for the 15 species. The single tree obtained is 18 steps long, but on the cladogram (Figure 1) I have added a 19th, homoplasious, step by keeping the "mima/lasseriana" branch separate from the "sophiifolia" lineage. The change involved (apparent loss of ligule) apparently is an easily modifiable genetic feature under simple control, since it has occurred in parallel on three additional branches. The tree was rooted at a position to emphasize the difference between the taxa with a woolly-tomentose vestiture and toothed leaves (sect. *Laennecia*, see below) and those with a more hirsute vestiture and mostly pinnatifid leaves (sect. *Sophiifolium*). The polarity of all except one of the character states in Table 1 has been inferred from the position of the root. I have regarded woolly vestiture as apomorphic, primarily because it appears developmentally more complex than nonwoolly. If, in reality, the reverse were true, it would slightly shift the root position to the base of the four species of the *Laennecia schiedeana* group and strengthen the otherwise weak link between *L. coulteri* and the species with pinnatifid leaves.

In this view of the phylogeny (Figure 1), the woolly taxa from high elevation habitats in northern South America, *Laennecia mima*, *L. lasseriana*, *L. prolialba* and including the more widespread *L. schiedeana*, form a primitive subgroup of sect. *Laennecia*. The latter species is variably hirsute-pilose to densely woolly, somewhat intermediate in this respect between the two sections.

The remainder of sect. *Laennecia* is restricted to North America, except for *L. filaginoides* and *L. gnaphalioides*, which also occur in South America, probably secondarily. Three endemics, primarily of northwestern México, *L. eriophylla*, *L. chihuahuana* and *L. pimana*, are the most advanced in this lineage. They are similar among themselves in their large achenes with thick, white ribs and their nonclasping, eglandular leaves. *Laennecia confusa* is similar to these in its nonclasping, eglandular leaves, but it has smaller, thin nerved achenes with relatively few pappus bristles and, alone in the genus, it produces fibrous roots. *Laennecia gnaphalioides* also forms large, distinctively thick ribbed achenes and is closely related to these species. *Laennecia filaginoides*, with its large number of pappus bristles and strongly developed outer

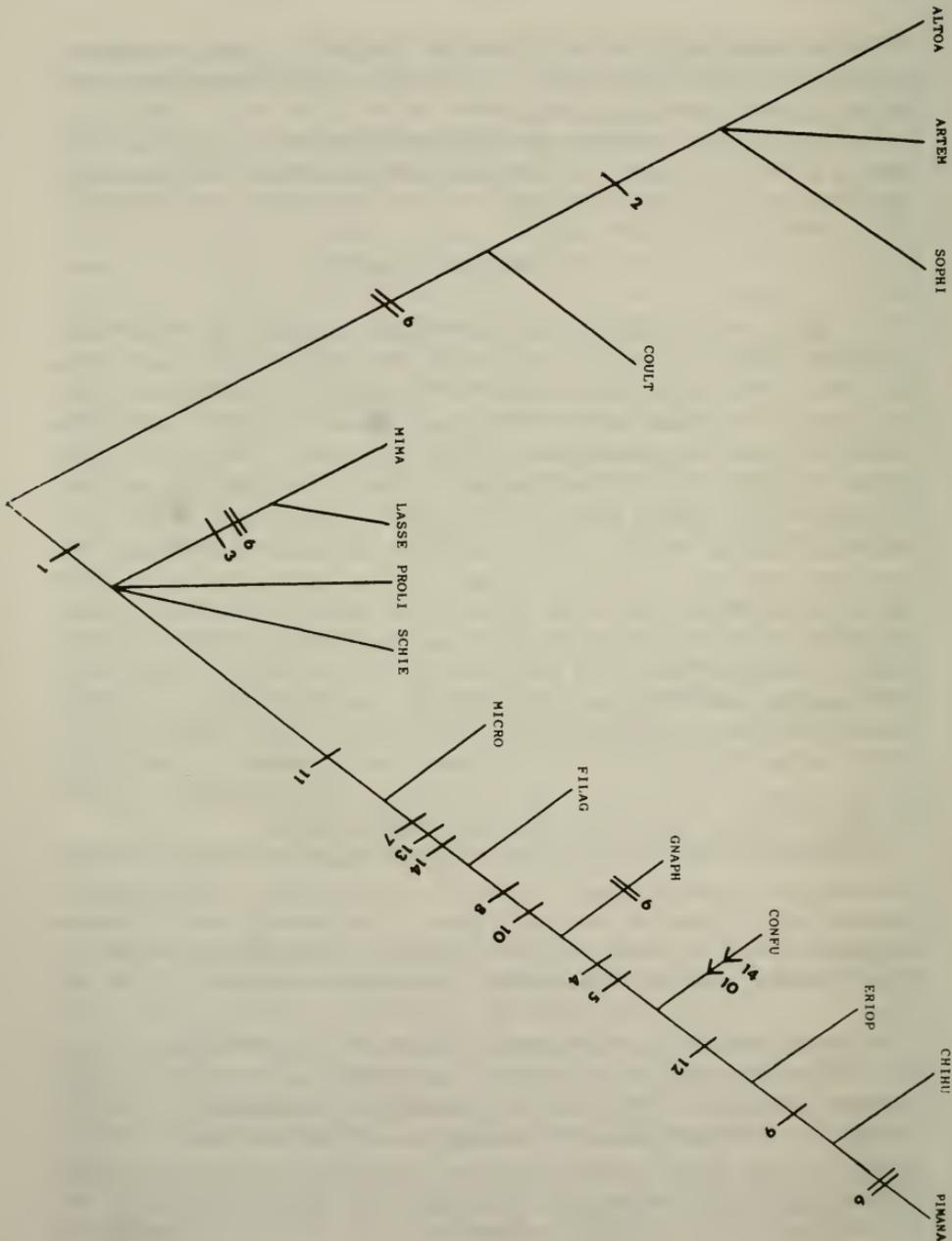


Figure 1. Cladistic relationships of the species of *Laennecia*. Numbers represent characters as listed in Table 1. Slash = synapomorphy; double slash = parallel synapomorphy; down arrow = reversal.

Table 1. Characters and character states of *Laennecia* used in the cladistic analysis (see discussion). Data matrix is shown in Table 2.

1. Vestiture (0) woolly (1) strigose-hirsute
2. Leaf margins (0) toothed (1) deeply pinnatifid
3. Leaf margins (0) flat, toothed to pinnatifid (1) revolute, nearly entire
4. Leaf bases (0) clasping (1) non-clasping
5. Leaves (0) glandular (1) eglandular
6. Ligules (0) present (1) absent
7. Style branch appendages (0) deltate (1) triangular-lanceolate
8. Achenial glands (0) non-resinous (1) with an expanded, apical, resin drop
9. Achenial hairs [Zwillingshaare] (0) present (1) completely absent
10. Achene ribs (0) thin (1) prominently thickened
11. Achene size (0) 0.8-1.5 mm long (1) at least some longer than 1.5 mm
12. Achene size (0) 0.8-1.9 mm long (1) 2.1-2.5 mm long
13. Number of pappus series (0) 1 (1) 2
14. Number of pappus bristles (0) 9-20 (1) [20-] 33-75

pappus, also is closely related to this group. The pappus of *L. microglossa* sometimes can be observed to have an "outer" series of a few, thin setae, but it is not nearly so prominent as in the other primarily Mexican taxa of sect. *Laennecia*. Among the species restricted to México, *L. microglossa* and *L. coulteri* appear to be the most primitive.

In sect. *Sophiifolium*, *Laennecia artemisiifolia* and *L. altoandina*, are endemic to southern South America. *Laennecia sophiifolia* is widespread in México and in Andean South America but apparently absent from most of Central America. Its deeply pinnatifid leaves suggest that its geographical origin was similar to the two South American endemics. *Laennecia coulteri* is provisionally included in sect. *Sophiifolium* on the basis of its essentially nonwoolly vestiture, eligulate ray flowers and the observation that its leaves sometimes, though uncommonly, are deeply toothed. It occurs only in North America and at relatively low elevations, and is morphologically similar to sect. *Laennecia* in its toothed leaves and tendency to produce a subwoolly (but mostly pilose-hirsute) vestiture. McVaugh (1984) also noted that a close similarity exists between *L. coulteri* and *L. sophiifolia*.

Table 2. Taxa of *Laennecia* with character states used in cladistic analysis.

TAXON	CHARACTER
	12345678901234
schie	00000000000000
proli	00000000000000
mima	00100100000000
lasse	00100100000000
eriop	00011011011111
chihu	00011011111111
piman	00011111111111
confu	00011011001010
gnaph	00000111011011
flag	00000010001011
micro	00000000001000
coult	10000100000000
sophi	11000100000000
artem	11000100000000
altoa	11000?00000000

Critical observations on types and typification of *Laennecia flaginoides* and *L. gnaphalioides* are found in Cuatrecasas (1969) and Zardini (1981). Taxonomic notes on *L. schiedcana* and other species are found in Blake (1917), Cuatrecasas (1970) and McVaugh (1984).

#### ARTIFICIAL KEY TO THE SPECIES OF *LAENNECIA*

1. Pistillate flowers ligulate .....(2)
- 1' Pistillate flowers eligulate .....(7)
  2. Leaves and phyllaries with sessile, resin glands; leaves clasping .(3)
  - 2' Leaves and phyllaries eglandular; leaves not clasping .....(5)
3. Plants perennial, from South America ..... *L. prolialba*
- 3' Plants annual, from North and Central America .....(4)

4. Stems basally branched and decumbent; herbage densely white woolly, completely obscuring the stems immediately below the heads; disc corollas 2.4-2.5 mm long ..... *L. microglossa*
- 4' Stems unbranched and strictly erect at the base; herbage variably woolly but never so densely so as to obscure any part; disc corollas 2.8-3.2 mm long ..... *L. schiedeana*
5. Plants fibrous rooted; achenes 1.4-1.8 mm long; pappus bristles 14-22; Sinaloa and Chihuahua south through Guerrero and San Luis Potosí to Chiapas and Guatemala ..... *L. confusa*
- 5' Plants taprooted; achenes 2.5-3.0 mm long; pappus bristles 35-75 .... (6)
6. Ligules 0.5-0.8 mm long, purple; achenes eglandular, strigose on the faces and thick, white margins; pappus of 35-45 bristles, essentially uniseriate or with a few, outer setae 0.3 mm long; southern Arizona to west central Chihuahua ..... *L. eriophylla*
- 6' Ligules 1.0-2.0 mm long, white; achenes with glands scattered over both faces or concentrated near the apex, without other vestiture; pappus of 60-75 bristles, with an outer series of linear scales 0.5-0.8 mm long; west central Chihuahua ..... *L. chihuahuana*
7. Stems and leaves densely and prominently woolly-tomentose ..... (8)
- 7' Stems and leaves coarsely hairy but not at all woolly-tomentose .... (13)
8. Plants of South America ..... (9)
- 8' Plants of North and Central America ..... (11)
9. Achenes densely silky-strigose, the surface completely obscured ..... *L. filaginoides*
- 9' Achenes sparsely strigose, the surface not obscured ..... (10)
10. Annuals, densely tomentose but the stem and leaf surfaces not completely obscured; phyllaries glandular and sparsely villous, the inner 4-5 mm long, with broad, hyaline margins ..... *L. mima*
- 10' Perennials, with a dense, white tomentum completely obscuring the stem and leaf surfaces; phyllaries glandular but otherwise glabrous, the inner 3.5 mm long, with the margins little differentiated from the middle portions ..... *L. lasseriana*
11. Achenes usually purplish, completely covered with a silky strigose pubescence, without thick, marginal ribs ..... *L. filaginoides*

- 11' Achenes tan, glabrous or silky strigose only on the margins and in a central patch on each face, with thick, white, marginal ribs ..... (12)
12. Leaves eglandular, not clasping; heads 6-7 mm wide; achenes glandular but otherwise glabrous; pappus bristles 33-39 .... *L. pimana*
- 12' Leaves glandular, clasping; heads 8-12 mm wide; achenes glandular, silky strigose on the margins and with a central patch of hairs on each face; pappus bristles 20-24 ..... *L. gnaphalioides*
13. Plants of North and Central America ..... (14)
- 13' Plants of South America ..... (15)
14. Leaves not clasping, often narrowed to a petiolar base, usually bipinnatifid, sometimes merely pinnatifid ..... *L. sophiifolia*
- 14' Leaves distinctly clasping, barely if at all reduced in width proximally, toothed, never bipinnatifid ..... *L. coulteri*
15. Leaves pinnately shallowly lobed; phyllaries broadly elliptic, apically obtuse; disc corollas 1.5 mm long ..... *L. altoandina*
- 15' Leaves pinnatifid to bipinnatifid; phyllaries linear-lanceolate, apically acute; disc corollas 2.2-3.4 mm long ..... (16)
16. Stems erect; heads 1.5-2.5(-4.0) mm wide, the inner phyllaries 2.5-3.0 mm long; disc corollas 2.2-2.6 mm long; pistillate corollas 0.8-1.2 mm long ..... *L. sophiifolia*
- 16' Stems decumbent; heads 4-5 mm wide, the inner phyllaries 3.0-3.5 mm long; disc corollas 2.5-3.4 mm long; pistillate corollas 1.5-1.8 mm long ..... *L. artemisiifolia*

#### TAXONOMIC SUMMARY

1. ***Laennecia altoandina*** (Cabrera) Nesom, *comb. nov.* BASIONYM: *Conyza altoandina* Cabrera, Bol. Soc. Argent. Bot. 14:347. 1972. TYPE: ARGENTINA. Prov. Jujuy: Dep. Capital, entre León y Nevado de Chani, Esquina, *Fabris, et al.* 4132 (HOLOTYPE: LP).

Short lived perennials with decumbent-ascending branches, sessile glandular and moderately villous-hirsute. Leaves subclasping, shallowly pinnatifid with a broad midregion or deeply 2-4 toothed, 1-2 cm long, 5-8 mm wide. Heads 4-5 mm wide, sessile or subsessile in a leafy, spicate, few headed panicle; phyllaries in 2-3 subequal series, with the inner 2.5-3.0 mm long, the outer broadly ovate, with broad hyaline margins and obtuse apices. Disc corollas

1.5 mm long. Achenes oblong-obovate, 1.2 mm long, glabrous to very sparsely strigose.

Argentina, in mountains of the Provincia de Jujuy; ca 4000 m.

I have not seen specimens of *Laennecia altoandina*, but judging from the description, illustration and contrasts in the key provided by Cabrera (1978), it is a member of *Laennecia* and distinct from the other species. In the Jujuy Province, where *L. altoandina* apparently is endemic, the closely related *L. artemisiifolia* and *L. sophiifolia* also occur.

2. *Laennecia artemisiifolia* (Meyen & Walp.) Nesom, *comb. nov.* BASSYONIM: *Conyza artemisiifolia* Meyen & Walp., Nov. Act. Acad. Caes. Leop. 19(Suppl. 1):262. 1843. TYPE: ARGENTINA, not seen. *Erigeron artemisiifolia* (Meyen & Walp.) Schultz-Bip., Bull. Soc. Bot. France 12:81. 1865.

*Conyza andicola* Philippi, Anal. Mus. Nac. Chile, Bot. 8:38. 1891.  
TYPE: CHILE, not seen. Not *Erigeron andicola* DC. As synonym *vide* Cabrera (1978).

*Erigeron senecioides* Wedd., *Chloris Andina* 1:198. 1856. TYPE: PERÚ, not seen. *Conyza senecioides* (Wedd.) Cabrera, Revista Invest. Agric. Bs. Aires 11:403. 1957. As synonym *vide* Cabrera (1978).

Taprooted annuals or short lived perennials, usually with several, prostrate to decumbent-ascending stems from the base. Stems, leaves and phyllaries with minute, sessile or short stipitate resin glands, also sparsely to moderately pubescent with thick based, multicellular, long attenuate, eglandular hairs, these sometimes becoming somewhat villous, also with much smaller, viscid-glandular but not stipitate hairs. Leaves pinnatifid to bipinnatifid, sessile to subclasping, sometimes slightly auriculate at the base, 1-2(-3) cm long. Heads 3-5 mm wide, on pedicels 0.5-2.0 mm long, in compact, spicate panicles; phyllaries narrowly triangular-lanceolate, in 2-4 equal to subequal series, the inner 3.0-3.5 mm long, the outer strigose with thick, multicellular, eglandular hairs, sessile glandular at least proximally, the margins broad and hyaline, with hyaline, long attenuate, and often purple apices. Pistillate corollas 1.5-1.8 mm long, eligulate, the stigma and style extending 0.8-1.0 mm above the corolla. Disc corollas 2.5-3.4 mm long, the tube 1.6-2.0 mm long, Achenes oblong-obovate, 0.8-1.2 mm long, thin nerved, sparsely strigose, with at least a few sessile, resin glands, these often clustered at the apex; pappus a single series of 11-15 fragile bristles 3.0-3.8 mm long at maturity.

Perú, Bolivia, Chile, Argentina; open rocky, sandy, or grassy sites, often in fallow fields or other disturbed sites; 3200-4200 m; flowering (January-) February-May.

*Laennecia artemisiifolia* is closely similar to *L. sophiifolia* but distinguished by its high elevation habitats, decumbent stems, and larger heads and corollas.

3. *Laennecia chihuahuana* Nesom, sp. nov. TYPE: MÉXICO. Chihuahua: Mpio. Ocampo, Parque Nacional de Cascada Basaseachic, [ca 4.5 km S of village of Basaseachic], on nearly barren rock at overlook ca 1 km airline S of Cascada, with *Arctostaphylos pungens*, *Quercus* cf. *crassifolia*, *Q. coccolobifolia*, sparse grasses; ca 2100 m, 3 Oct 1986, R. Spellenberg, et al. 8695 (HOLOTYPE: NMC!; Isotypes: ESAHE, MEXU, TEX!, UC).

*Erigeron eriophyllus* A. Gray similis sed ligulis albis longioribus, acheniis glandulosis sed aliter glabris, et setis pappo numerosioribus differt.

Short lived perennials, 25-40 cm tall, from a slender, woody taproot. Stems, leaves and phyllaries closely gray woolly, eglandular, the phyllaries and upper leaf surfaces glabrescent to glabrate. Leaves narrowly oblong to linear-ob lanceolate, sessile, entire or with a few, shallow teeth, 10-30 mm long, 1-3 mm wide, slightly reduced in size upward. Heads 8-10 mm wide (pressed), in panicles or loose corymbs, on peduncles mostly 1-3 cm long; phyllaries in 3-4 graduated series, the innermost 7.0-7.5 mm long, the inner with a narrow, green midregion extending to the base or nearly so, the margins indurated-scarious, often purplish. Pistillate corollas 6.0-6.5 mm long, the ligules prominent, 1.0-2.0 mm long, 0.3-0.5 mm wide, white. Disc corollas glabrous with a few hairs, white to cream, 5.0-5.5 mm long, the tube 3.0-3.5 mm long, throat gradually ampliate, the lobes 0.5-0.7 mm long. Achenes obovate to widely obovate, 2.5-3.0 mm long, 1.3-1.5 mm wide, strongly flattened, the faces tan, with thick, white margins, the whole surface sparsely glandular with sessile resin glands, or the glands sometimes concentrated near the neck, without other vestiture; pappus of 60-75 thickened, minutely barbellate bristles 5.0-5.5 mm long, with a prominent outer series of linear to narrowly triangular scales 0.5-0.8 mm long. Chromosome number unknown.

Known only from the vicinity of Basaseachic in west central Chihuahua, México; oak or oak-pine woods; 2000-2100 m; September-November.

Additional collections examined: MÉXICO. Chihuahua: Mpio. Creel, Cusarare. S of Creel, open, grazed slope, top of gully eroded area, 14 Sep 1973, *Bye 5038* (TEX); Mpio. Ocampo, Parque Nacional de Cascada Basaseachic, headwaters of Río Mayo: pine-oak forest above waterfall, 2000 m, 2 Oct 1983, *Martin & O'Rourke s.n.* (ARIZ); above falls near parking lot, 2000 m, 14 Oct 1985, *Martin s.n.* (ARIZ); ca 3 km S of village of Basaseachic, steep, E facing slope with large boulders and rock faces, above river and trail to falls, grassy area among *Pinus*, *Cupressus*, shrubby oaks and dominant *Garrya*, ca 2050 m, 19 Oct 1986, *Nesom & Vorobik 5690* (MEXU, TEX).

*Laennecia chihuahuana* is characterized by a taproot, woolly but eglandular stems, leaves and phyllaries, ligulate pistillate corollas, large, thick ribbed and glandular but otherwise glabrous achenes, and a biseriate pappus of 60-75

bristles with a prominent outer series of scales. It is most closely related to *L. criophylla*, *L. pimana* and *L. confusa*, which are united as a group by their woolly but nonglandular herbage and their sessile but nonclasping leaves.

4. ***Laennecia confusa*** (Cronq.) Nesom, *comb. nov.* BASIONYM: *Conyza confusa* Cronq., Bull. Torrey Bot. Club 70:632. 1943. Based on: *Erigeron gnaphalioides* Kunth, *Nov. Gen. Sp.* 4[quarto]:88. 1820; 4[folio]:69. 1818. *Stenactis gnaphalioides* (Kunth) Cass., *Dict. Sci. Nat.* 1:484. 1827. *Heterochaeta gnaphalioides* (Kunth) DC., *Prodr.* 5:282. 1836. Non *Conyza gnaphalioides* Kunth ( $\equiv$  *Laennecia gnaphalioides* [Kunth] Cass.). TYPE: MEXICO. Guanajuato: *Humboldt & Bonpland s.n.* (HOLOTYPE: P, fiche!).

Perennials, fibrous rooted, the whole plant woolly. Leaves densely white beneath, green glabrate to much less hairy above, eglandular, the basal usually persistent, the cauline narrowly oblong-elliptic, not clasping, entire to few toothed. Capitulescence a narrow, spike like panicle or sometimes the heads few and on long, divergent-ascending peduncles; pistillate corollas with a white ligule 0.5-2.5 mm long. Achenes 1.0-1.8 mm long, with thick margins, sparsely pilose or strigose, rarely glabrous, usually prominently papillate glandular on the faces, at least near the apex; pappus of 14-22 bristles, with an outer series of bristle like setae 0.1-0.3 mm long. Chromosome number,  $n=9$  pairs.

Sinaloa, Chihuahua, Durango, Nayarit, Zacatecas, Jalisco, Michoacán, Guanajuato, Guerrero, México, San Luis Potosí. apparently disjunct to Chiapas and Guatemala; clearings or meadows among pines or pine-oak; 1500-2750 m; August-November.

Within *Laennecia confusa*, there appear to be two elements that may ultimately be recognized as separate species. From Guatemala north to southern Durango, the achenes are narrowly elliptic, sparsely but evenly strigose and evenly glandular. In northern Durango and southern Chihuahua, the achenes are obovate, strigose only on the margins and the glands are clustered near the apex. In both forms, however, there are never more than 22 pappus bristles and the achenes are less than 2.0 mm long.

5. ***Laennecia coulteri*** (A. Gray) Nesom, *comb. nov.* BASIONYM: *Conyza coulteri* A. Gray, Proc. Amer. Acad. Arts 7:355. 1868. Syntypes (as cited by Gray): UNITED STATES. [Arizona or California]: *Coulter 285 & 286* (GH, not seen). *Conyzella coulteri* (A. Gray) E. Greene, *Fl. Francisc.* 386. 1897. *Eschenbachia coulteri* (A. Gray) Rydb., Bull. Torrey Bot. Club 33:154. 1906.

*Erigeron discoideus* Kellogg, Proc. Calif. Acad. Sci. 5:55. 1873. TYPE: UNITED STATES. California: Island of the San Juan River, Webb's Landing, late autumn 1872, *Kellogg s.n.* (Not seen). As synonym *vide* Ferris (1960).

Taprooted annuals, moderately to densely pubescent with jointed hairs of varying lengths. Leaves 2-15 mm wide, regularly toothed or shallowly lobed, clasping to subclasping, with papillate sessile resin glands. Capitulescence a spike like panicle to broader, more elliptic or nearly corymboid in shape. Phyllary apices long acuminate and membranous. Pistillate corollas eligulate. Achenes light tan, sparsely strigose, 0.8-1.2 mm long, 0.3 mm wide, usually with minute, short stipitate to sessile glands; pappus uniseriate, of 9-16 bristles. Chromosome number,  $n=9$  pairs.

Baja California Norte, Sonora, Chihuahua, Durango, Zacatecas, Jalisco, Coahuila, Nuevo León, San Luis Potosí, Tamaulipas and the adjacent United States (Texas, Colorado, New Mexico, Arizona, Nevada, California); roadsides, fields, grasslands, moist meadows, brushy plains and rocky deserts, often associated with *Larrea*, *Agave*, *Prosopis* and *Acacia*; (5-)1250-2350(-2700) m; (February-)May-November.

*Laennecia schiedeana* is superficially similar to *L. coulteri* and might be confused in identification with it. *Laennecia coulteri* is distinguished from the former by the lack of well developed arachnoid pubescence, larger, more toothed vs pinnatifid leaves, broader capitulescences, distinctive phyllary apices, eligulate pistillate corollas and slightly smaller achenes. In addition, it is a species of much lower elevations and more arid habitats.

6. *Laennecia eriophylla* (A. Gray) Nesom, *comb. nov.* BASIONYM: *Erigeron eriophyllus* A. Gray, Smithsonian Contr. Knowl. 5 (*Pl. Wright.* 2):77. 1853. *Conyza eriophylla* (A. Gray) Cronq., Bull. Torrey Bot. Club 70:632. 1943. TYPE: UNITED STATES. Arizona: [Cochise Co.], Sonoita Creek, Sep 1851, *C. Wright s.n.* (HOLOTYPE: GH!).

Short lived perennials from a slender but woody taproot, densely covered with a white, woolly indument. Stems 15-40 cm tall, sometimes much branched from the bottom third. Leaves often glabrate on the upper surface, eglandular, the basal and lower cauline oblanceolate, not clasping, sometimes slightly revolute, 2-3 cm long, 4-5 mm wide, shallowly serrate with 1-4 pairs of teeth on the distal margins, becoming linear, entire and gradually reduced in size upward. Heads 7-9 mm wide on peduncles mostly 1.5-4.5 cm long, in panicles or loose corymbs; phyllaries in 3-5 strongly graduated series, the innermost 5.5-7.0 mm long, the inner with a distal, narrowly elliptic, green, *Aster* like, central area between and above white, indurated zones, with purple apices, the margins hyaline. Pistillate corollas filiform, 4.5-5.0 mm long, the ligules erect, 0.5-0.8 mm long, purplish. Disc corollas glabrous or with a few hairs, 4.3-5.5 mm long, the tube 2.8-3.5 mm long, throat gradually ampliate, lobes 0.3-0.6 mm long, often purplish. Achenes elliptic-oblong, 2.1-3.0 mm long, 0.9-1.0 mm wide, strongly flattened, with 2, thick, white, marginal ribs, the faces tan, faces and margins sparsely to moderately but prominently long strigose, eglandular; pappus a series of 35-45 very slender, barbellate bristles 4.5-5.5 mm

long, sometimes with a few, inconspicuous, outer setae. Chromosome number unknown.

South central Arizona (Cochise and Santa Cruz counties) and west central Chihuahua (probably also in northeast Sonora); gravely soil in semidesert grassland, dry oak or pine-oak woodlands; 1000-2000 m; flowering July-October (-November).

To my knowledge, this paper is the first to report the occurrence of *Laennecia eriophylla* in México. A number of collections from western Chihuahua are known, and the species almost certainly occurs in Sonora, although I have not seen collections from there. Citations are provided from both the United States and México, because this species has been poorly known from both areas.

MÉXICO. Chihuahua: Mpio. Ocampo, Ocampo, mine site SW of town, sterile soils around hydrothermal outcrop, 1800 m, 26 Jul 1986, *Moore, et al. s.n.* (ARIZ); Parque Nacional de Cascada Basaseachic, more or less open, dry, *Pinus durangensis-Quercus hypoleucoides* woods in barranca to W of falls, on open rock, ca 1800 m, 14 Sep 1987, *Spellenberg 9310* (MEXU,NMC,TEX); Mpio. Temosachic, Nabogame, oak and oak-pine woodland, 1800 m, 1987 and 1988, *Laferrrière 1570* (ARIZ), *1772* (TEX), *839* (TEX), & *2315* (TEX); 24.5 mi W of Basaseachic on Hwy 16, 4.2 mi E of Yepachic, large area of mostly bare, rock outcrops with scattered oaks, junipers, and manzanitas, 2010 m, 20 Aug 1984, *Nesom 5120* with P. Lewis (MEXU,NMC,TEX).

UNITED STATES. Arizona: Santa Cruz Co., Nogales to Ruby, 4300 ft, 25 Aug 1940, *Kearney & Peebles 14914* (ARIZ-2 sheets,LL); near Ruby, oak-grass association, 4300 ft, 2 Oct 1937, *Kearney & Peebles 13783* (ARIZ,LL); Pajarito Mts., 3.5 mi by jeep trail SE of Montana Peak, WSW of Yank Spring on Bald Spot at ridge top, W of Sycamore Canyon, 4480 ft, 22 Oct 1981, *Reichenbacher 909* (ARIZ); Atascosa Mts., 3.7 mi SE of Ruby on road to Peña Blanca Lake, 4350 ft, 21 Sep 1981, *Van Devender & Koppinger s.n.* (ARIZ).

In addition to the features noted in the key, *Laennecia eriophylla* is characterized by its phyllaries in 3-5 strongly graduated series, the inner with a distal, narrowly elliptic, green and "Aster like" central area, between and above the white, indurated zones.

7. *Laennecia flaginoides* DC., *Prodr.* 5:376. 1836. *Conyza flaginoides* (DC.) Hieron., *Bot. Jahrb. Syst.* 28:588. 1901. TYPE: MÉXICO. México: Environs de México, 16 Aug 1827, *Berlandier 820* (HOLOTYPE: G-DC, fide!; Isotypes: BM,G,GH!,P).

*Heterochaeta stricta* Benth., *Pl. Hartweg.* 206. 1845. TYPE: ECUADOR. Near Quito, *Hartweg 1145* (LECTOTYPE [Cuatrecasas by annotation, *fide* Zardini 1981] K; Isolectotypes: BM,GH!,NY,P). The Hartweg plant on the GH sheet is *Laennecia flaginoides*; achenes in the packet mounted directly below, are from *L. gnaphalioides*

and perhaps came from the plant of *L. gnaphalioides* (Holton s.n.) mounted on the same sheet.

*Laennecia pinnatifida* Turcz., Bull. Soc. Imp. Nat. Mosc. 24:178. 1851.

TYPE: ECUADOR. Near Quito, Aug 1846, *Jameson 637* (Isotype: GH!).

Taprooted annuals, the whole plant densely white tomentose. Leaves linear-oblong, subclasping, shallowly toothed, glandular. Heads 5-6 mm wide, in a spike like panicle. Perfect flowers 3-10, strongly goblet shaped; pistillate corollas eligulate. Achenes obovate, basally acute, 1.2-1.6 mm long, 0.6-0.8 mm wide, usually purplish, completely covered by long, silky hairs, glandular; pappus biseriate, the outer a series of 34-40 short bristles 1.0-1.2 mm long, with ca 20 shorter and uneven bristles 1.0-1.2 mm long. Chromosome number  $n=9$  pairs.

Baja California Sur, Sonora, Chihuahua, Durango, Zacatecas, Guanajuato, Jalisco, Michoacán, Aguascalientes, México, Hidalgo, Puebla, Nuevo León, San Luis Potosí, Veracruz, Oaxaca and Chiapas, Guatemala, and South America (Venezuela, Colombia, Ecuador and Perú); roadsides or meadows, often with pine or oak-pine; 1600-3100 m; flowering July-November.

8. *Laennecia gnaphalioides* (Kunth) Cass., Dict. Sci. Nat. 25:92. 1822. BASIONYM: *Conyza gnaphalioides* Kunth, *Nov. Gen. Sp. Pl.* 4[folio]:57. 1818; 4[quarto]:73, pl. 327. 1820. *Marsea gnaphalioides* (Kunth) Badillo, Bol. Soc. Ven. Cienc. Nat. 10:257. 1946. TYPE: VENEZUELA. Locis alsis montis Cocollar, *Humboldt & Bonpland s.n.* (HOLOTYPE: P, fiche!).

*Laennecia parvifolia* DC., *Prodr.* 5:376. 1836. TYPE: MÉXICO. México: Valle de Toluca, Oct 1827, *Berlandier 1124* (HOLOTYPE: G-DC, fiche!; Isotype: P). This was included as a synonym of *L. gnaphalioides* by Cuatrecasas (1969) but of *L. filaginoides* by Zardini (1981).

*Erigeron niveus* Schultz-Bip., Bull. Soc. Bot. Fr. 12:85. 1865. TYPE: BOLIVIA. La Paz, Sorata, Feb-Mar 1858, *Mandon 221* (HOLOTYPE: P; Isotypes: BM,F,G,GH,K,LP,NY).

*Conyza evacioides* Rusby, Bull. N.Y. Bot. Gard. 4:385. 1907. TYPE: BOLIVIA. Yungas, 1890, *Bang 1875* (HOLOTYPE: NY; Isotypes: F,G,GH!,K,NY,US!).

*Conyza pulcherrima* M.E. Jones, Contr. W. Bot. 12:47. 1908. TYPE: MÉXICO. Chihuahua: Soldier Canyon, Sierra Madre Mountains, 16 Sep 1903, *M.E. Jones s.n.* (HOLOTYPE: POM; Isotypes: ARIZ!, BM,US!).

Similar in habit, vestiture and habitat to *Laennecia filaginoides* and often growing with it. Leaves entire to apically toothed, densely woolly, glandular. Heads 9-12 mm wide; phyllaries usually purple tipped. Pistillate corollas eligulate. Achenes light brown, often with a golden sheen, orbicular-obovate to obovate, usually with thick rib like margins, 1.5-2.0 mm long, 0.9-1.5 mm wide, margins fringed with long, silky hairs, each face with a central patch of hairs; pappus of 20-24 bristles, with an outer pappus a corona of lacinate, lanceolate scales (0.1-)0.3-0.6 mm high. Chromosome number  $n=9$  pairs.

Chihuahua, Durango, Jalisco, Aguascalientes, Michoacán, México, San Luis Potosí, Veracruz, Oaxaca, Chiapas, disjunct to South America, where known from Venezuela, Colombia, Ecuador, Perú and Bolivia; clearings, wet meadows, grasslands or pastures, usually in areas of oak-pine, pine-juniper, or pine woods; 2000-2700(-3800 in South America) m; flowering August-November.

9. *Laennecia lasseriana* (Aristeg.) Nesom, *comb. nov.* BASIONYM: *Conyza lasseriana* Aristeg., in Lasser, *Fl. Venezuela* 10:287. 1964. TYPE: VENEZUELA. Mérida: Páramo de Los Leones, W of Mucuruba, 3500 m, May 1930, Gehriger 127 (HOLOTYPE: US!).

Perennials from a slender but woody base, the stems and leaves with a dense and close white tomentum obscuring the surface, also with sessile to short stipitate resin glands. Stems erect, 10-25 cm tall, often much branched. Leaves narrowly oblong to oblong-lanceolate, densely arranged, sessile to sub-clasping, sometimes slightly auriculate, 4-10 mm long, 0.5-2.0 mm wide, entire to shallowly toothed, particularly near the apex, margins often distinctly revolute. Heads 4-5 mm wide, sessile, in compact, terminal clusters of 2-5 or in short, narrow, spicate panicles; phyllaries reddish purple, sometimes with a discernible greenish central area and narrow midvein, the margins with a very narrow, hyaline edge but mostly not differentiated from the inner area, glandular but otherwise glabrate, narrowly triangular in 3-4 equal to subequal series, the inner 3.5 mm long. Pistillate corollas 1.8-2.2 mm long, eligulate, the stigma and styles extending 0.5 mm above the corolla. Disc corollas 3.0 mm long, the tube 2.0 mm long, the lobes cut to nearly the bottom of the limb. Achenes obovate to oblong-obovate, 0.8-1.0 mm long, with 2(-3) very thin nerves, sparsely strigose, minutely sessile glandular; pappus a single series of 14-16 slender bristles, 2.8-3.0 mm long at maturity.

Endemic to paramos in western Venezuela (state of Mérida); rocky slopes; ca 2700-3500 m; flowering January-May.

*Laennecia lasseriana* is recognized by its perennial duration, dense, white tomentum, narrow, short, densely arranged leaves, and reddish and glandular but otherwise glabrate phyllaries.

10. *Laennecia microglossa* (S.F. Blake) Nesom, *comb. nov.* BASIONYM: *Erigeron microglossus* S.F. Blake, *Contr. Gray Herb.*, n.s. 52:31. 1917.

*Conyza microglossa* (S.F. Blake) Cronq., Bull. Torrey Bot. Club 70:632. 1943. TYPE: MÉXICO. San Luis Potosí. Mountains near San Miguelito, Aug 1876. *Schaffner 215* (HOLOTYPE: GH!).

*Conyza dentonae* McVaugh, Contr. Univ. Michigan Herb. 9:364. 1972. TYPE: MÉXICO. Jalisco: [Mpio. Ojuelos.] Grasslands near Km 18, SW of Ojuelos on the road to Aguascalientes, 15 Aug 1958, *McVaugh 16974* (HOLOTYPE: MICH!).

Taprooted annuals, much branched from the base, the whole plant woolly. Leaves narrowly oblong-oblancheolate, shallowly toothed, clasping, glandular. Capitulescence open and diffuse; pistillate corollas with a ligule 0.2-0.4 mm long, about as long as the style branches. Achenes sparsely strigose, narrowly elliptic-oblancheolate, 1.1-1.7 mm long, 0.4-0.5 mm wide, with a few resinous glands near the apex, without prominently thickened margins; pappus of 13-17 bristles, biseriate but the outer series no more than a few setae. Chromosome number unknown.

Chihuahua, Durango, Zacatecas, Jalisco, and San Luis Potosí; grasslands or brushy plains, often with oaks, acacia, or cacti; 1800-2250 m; flowering May-September.

*Laennecia microglossa* is recognized by its annual duration, woolly vestiture, pistillate corollas with short ligules and essentially simple pappus of 13-17 bristles.

11. *Laennecia mimia* (S.F. Blake) Nesom, *comb. nov.* BASIONYM: *Conyza mimia* S.F. Blake, Contr. Gray Herb. 52:32. 1917. TYPE: VENEZUELA. Páramo de Mucuchieć (Mucuchies) Oct, *Moritz 1404* in part (HOLOTYPE: B).

Taprooted annuals, erect, 5-30(-40) cm tall, the stems and leaves moderately to densely villous-tomentose with thin based trichomes, the surfaces not completely obscured, also with numerous, sessile, resin glands. Leaves narrowly oblong to oblong-lanceolate, densely arranged, 8-20 mm long, 2-4 mm wide, slightly auriculate, the margins shallowly toothed, particularly near the apex, less commonly entire, sometimes slightly revolute. Heads 4-6 mm wide, sessile to subsessile, rarely on pedicels 2-8 mm long, in spicate panicles; phyllaries glandular and sparsely villous with multicellular trichomes much thicker than elsewhere on the plant, narrowly ovate-lanceolate with broad, hyaline margins, in 2-3 equal to subequal series, the inner 4-5 mm long. Pistillate corollas eligulate, 1.8-2.1 mm long, the stigma and styles extending 0.3-0.5 mm above the corolla. Disc corollas 2.6-3.4 mm long, the tube 1.6-2.0 mm long. Achenes narrowly obovate to elliptic-obovate, 0.9-1.0 mm long, sparsely strigose, thin nerved; pappus a single series of 10-11 bristles 3.0-3.2 mm long at maturity.

Paramos in western Venezuela (state of Mérida); open, gravely or rocky slopes, sometimes dominated by *Espeletia*; 3560-4200 m; flowering September-December.

*Laennecia mima* is recognized by its annual duration, villous-tomentose pubescence not completely obscuring the surfaces, narrow, mostly entire leaves, eligulate pistillate corollas and small, thin nerved achenes.

12. *Laennecia pimana* Nesom & Laferrière, *Phytologia* 68:202. 1990. TYPE: MÉXICO. Chihuahua: Mpio. Temosachic, 1 km E of Nabogame, 28 Oct 1988, *J.E. Laferrière 2216* (HOLOTYPE: TEX!; Isotype: MEXU!).

Taprooted perennials. Leaves woolly above and beneath, mostly entire, not clasping. Heads in a spike like capitulescence, on peduncles 5-15 mm long; innermost phyllaries 6-7 mm long. Pistillate corollas eligulate. Disc corollas 4.3-5.0 mm long. Achenes obovate, 1.9-2.2 mm long, 0.8-1.0 mm wide, the faces tan, with thick, white, marginal ribs, glabrous except for a few sessile resin glands near the apex; pappus of 33-39 bristles, with an outer series of setae or bristles 0.3-0.5 mm long.

Known only from the vicinity of Nabogame in west central Chihuahua, México; pine-oak woods; 1800 m; September-November.

*Laennecia pimana* is recognized by its perennial duration, densely tomentose vestiture, eligulate pistillate corollas, large, glandular, but otherwise glabrous achenes with thick, marginal ribs and its biseriate pappus with numerous bristles.

13. *Laennecia prolialba* (Cuatr.) Nesom, *comb. nov.* BASIONYM: *Conyza prolialba* Cuatr., *Phytologia* 9:3. 1963. TYPE: COLOMBIA. Dist. Magdalena: Prados paramuños y rocosos entre las lagunas Naboda, Mamito, y Mamo, 4200-4300 m, 4 Oct 1959, *Cuatrecasas & Romero-C. 24595* (HOLOTYPE: US!; Isotypes: COL,P).

Short lived perennials from a woody taproot. Sterile plants: forming low (3-5 cm high) mounds, with a dense, white tomentum completely obscuring the surfaces. Flowering plants: stems erect, 2-4(-6) dm tall, stems and leaves moderately to densely villous-tomentose with thin based trichomes, at least the leaves glabrescent and the surfaces not completely obscured, also with sessile to short stipitate resin glands. Cauline leaves lanceolate to oblong-lanceolate, slightly auriculate, subclasping, the margins sinuate to toothed, mostly 1-2(-3) cm long, 2-3(-5) mm wide. Heads 4-6 mm wide, sessile to subsessile or less commonly on pedicels to 5 mm long, in leafy, spicate panicles; phyllaries narrowly ovate-lanceolate with acuminate apices and broad, hyaline margins, glandular, villous with vitreous, thick based trichomes, in 2-4 equal to subequal series, the inner 4-5 mm long. Pistillate corollas 2.0-2.8 mm long, including the ligules 0.3-0.7 mm long. Disc corollas 3.0-3.5 mm long, the tube

2.0-2.2 mm long. Achenes obovate to narrowly obovate, thin nerved, tan to purplish, 0.8-1.1 mm long, glabrous or commonly very sparsely strigose with short, appressed hairs, eglandular or with glands clustered at the apex; pappus a single series of 10-17 bristles 2.6-3.0 mm long.

Colombia and Ecuador; open, rocky sites in paramo or subparamo, rarely lower in matorral; 2700-3900(-4300) m; flowering September-April.

*Laennecia prolialba* is very similar to *L. schiedeana*, and as noted by Cuatrecasas (1963), the two might reasonably be considered conspecific. The South American plants, however, are distinguished by their high elevation habitats, perennial duration and peculiar, mounded, densely tomentose growth forms in their nonflowering phases. The species is otherwise recognized by its pistillate corollas with short ligules, leafy, spicate panicles, glabrous or glabrate achenes, eglandular or glandular near the apex and with 10-15 pappus bristles.

14. *Laennecia schiedeana* (Less.) Nesom, *comb. nov.* BASIONYM: *Erigeron schiedeana* Less., *Linnaea* 5:145. 1830. *Conyza schiedeana* (Less.) Cronq., *Bull. Torrey Bot. Club* 70:632. 1943. TYPE: MÉXICO. Veracruz: Llanos de Perote, Sep 1828, *Schiede 314* (B, *fide* Blake, 1917; Isotype seen by McVaugh 1984).

*Conyza subdecurrens* DC., *Prodr.* 5:379. 1836. *Erigeron subdecurrens* (DC.) Schultz-Bip. *ex* A. Gray, *Synopt. Fl. N. Amer.* 2(1):220. 1884. *Leptilon subdecurrens* (DC.) Small, *Man. Fl. S.E. U.S.* (ed. 2) 1371. 1913. TYPE: MÉXICO. Cordillera de Guchilapa, 20 Oct 1827, *Berlandier 1044 ex/14* (HOLOTYPE: G-DC, *fiche!*).

*Conyza erythrolaena* Klatt, *Jahrb. Hamburg Wiss. Anstalt* 10, 2:125. 1893. TYPE: MÉXICO. Michoacán: Hills near Patzcuaro, 21 Dec 1891, *Pringle 3984* (HOLOTYPE: B?; Isotypes: MEXU!, US-2 sheets!).

*Erigeron subspicatus* Benth. *in* Oerst., *Kjoeb. Vidensk. Meddel.* 82. 1852. *Conyza prolialba* Cuatr. var. *subspicata* (Benth.) Cuatr., *Phytologia* 9:5. 1963. TYPE: COSTA RICA. Volcán Irazu, *Oersted 268* (HOLOTYPE: K).

*Leptilon integrifolium* Woot. & Standl., *Contr. U.S. Natl. Herb.* 16:183. 1913. TYPE: UNITED STATES. New Mexico: Mogollon Mts., West Fork of the Gila River, 28 Aug 1903, *Metcalf 610* (HOLOTYPE: US!).

*Erigeron subspicatus* Benth. var. *leiocarpus* S.F. Blake, *Brittonia* 2:337. 1937. TYPE: GUATEMALA. Sierra Cuchumatanes, alpine meadows, along trail between Huehuetenango and Soloma, 3260 m, 14 Sep 1934, *Skutch 1214* (HOLOTYPE: GH!).

Taprooted annuals 2-5(-10) dm tall, most of the plant moderately to densely covered with relatively thick, multicellular hairs, these immediately protracted into very long, filiform, crisped apices that produce a woolly-arachnoid pubescence, the hairs on the phyllaries continuing as thick and jointed for their whole length. Leaves lanceolate-oblong, 2-8 mm wide, entire to shallowly toothed near the apex or rarely shallowly lobed, clasping, with sessile to short stipitate, orange resin glands. Capitulescence usually a narrow, spike like panicle. Pistillate corollas with ligules 0.3-1.4 mm long. Achenes brown to slightly purplish, lustrous, sparsely short strigose to glabrous, oblong-obovate, 1.0-1.4 mm long, 0.4-0.7 mm wide, glandular near the apex or apparently sometimes eglandular, the ribs not thick or markedly differentiated in texture from the faces; pappus a single series of 15-20 bristles. Chromosome number,  $n=9$  pairs.

Baja California Norte, Chihuahua, Sinaloa, [Coahuila?], Nuevo León, Michoacán, Guerrero, Guanajuato, San Luis Potosí, Hidalgo, Edo. México, Morelos, Puebla, Veracruz, apparently disjunct to Chiapas, Guatemala and Costa Rica, in the United States in New Mexico, Arizona, Colorado; fields, llanos, rocky hillsides, or meadows at timberline, in areas of pine, pine-oak, or fir, 1750-4000 m; August-November(-January).

A widespread species, highly variable in the amount of woolly pubescence and glandularity of the achene apex. It is distinctive, however, among the species with woolly pubescence in having some of the hairs continue as thick and multicellular for their whole length and in the conspicuous resin glands on the vegetative parts.

15. *Laennecia sophiifolia* (Kunth) Nesom, *comb. nov.* BASIONYM: *Conyza sophiifolia* Kunth, *Nov. Gen. & Sp.* 4[folio]:56. 1818; 4[quarto]:72, pl. 326. 1820. *Marsea sophiifolia* (Kunth) Badillo, *Bol. Soc. Venez. Cienc. Nat.* 10:256. 1946. TYPE: MÉXICO. [México]: Chalco, *Bonpland 4156* (HOLOTYPE: P, fide!; Isotype: F, fragment).

*Conyza pulchella* Kunth, *Nov. Gen. & Sp.* 4[folio]:56. 1818; 4[quarto]:72. 1820. TYPE: MÉXICO. México: Moran, *Humboldt & Bonpland 4104* (HOLOTYPE: P, fide!).

*Conyza coulteri* A. Gray var. *tenuisecta* A. Gray, *Synopt. Fl. N. Amer.* 1(2):221. 1884. *Eschenbachia tenuisecta* (A. Gray) Woot. & Standl., *Contr. U.S. Natl. Herb.* 16:186. 1913. TYPE: UNITED STATES. Arizona: Near Ft. Huachuca, 1882, *Lemmon s.n.* (HOLOTYPE: GII!).

*Conyza serpentaria* Grisebach, *Abhandl. Königl. Gesellsch. Wissens. Gott.* 24:176. 1879. As synonym *fide* Cabrera (1978).

Erect, taprooted annuals 3-7 dm tall, with stems, leaves and phyllaries papillate or stipitate resinous glandular and spreading hairy with coarse,

translucent, prominently multicellular hairs. Leaves once or twice pinnately dissected, not clasping. Heads 1.5-2.5(-3.5) mm wide, in an elongated, narrowly columnar to pyramidal panicle; phyllaries in 2-4 equal to subequal series, the inner 2.5-3.0 mm long, apices long acuminate and membranous. Pistillate corollas 0.8-1.2 mm long, eligulate. Disc corollas 2.2-2.6 mm long. Achenes 0.7-0.8 mm long, 0.3 mm wide, with thin nerves, very sparsely short strigose, minutely stipitate glandular; pappus a single series of 9-12(-15) bristles 2.5-3.0 mm long. Chromosome number,  $n=9$  pairs.

Baja California Sur, Sonora, Sinaloa, Chihuahua, Durango, Nayarit, Jalisco, Michoacán, Zacatecas, Aguascalientes, Guerrero, Edo. México, Hidalgo, San Luis Potosí, Puebla, Veracruz, Oaxaca and Chiapas, Guatemala to El Salvador in Central America, and from there apparently disjunct to the Andean regions of South America in Colombia, Ecuador, Bolivia, Argentina, in the United States in Arizona, New Mexico and Texas; roadsides, clearings and other disturbed sites, desert flats, in areas of grassland, juniper, oak, pine; 1000-2700 m; flowering June-October.

*Laennecia sophiiifolia* is very similar to high altitude *Laennecia artemisiifolia* from South America, but the former is strictly erect and has smaller heads and corollas. The plants of South America are clearly conspecific with those from North and Central America.

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