THREE NEW SPECIES OF *KOANOPHYLLON* (ASTERACEAE: EUPATORIEAE) FROM MEXICO

Billie L. Turner  
Plant Resources Center  
The University of Texas  
Austin, Texas 78713  
billie@uts.cc.utexas.edu

ABSTRACT

Three new species of *Koanophyllon* are added to the Mexican Flora: *K. coixtlahuacum* B.L. Turner, from Oaxaca; *K. concordianum* B.L. Turner, from Sinaloa; and *K. revealii*, from Guerrero and Oaxaca. In addition, a new varietal combination is proposed: *K. solidaginoides*: var. *filicaulis* (Sch.-Bip. ex A. Gray) B.L. Turner, a widespread taxon in eastern Mexico. Distribution maps are provided, along with photoholotypes. The several taxa are keyed along with yet other Mexican taxa in the format of Turner’s 1997 treatment of *Koanophyllon* in which 21 species were recognized; the current account brings this total to 24. *Phytologia* 91(2): 312-324 (August, 2009).

KEY WORDS: Asteraceae, Eupatorieae, *Koanophyllon*, Mexico.

Routine identification of Mexican Asteraceae has revealed the following novelties:

**KOANOPHYLLON COIXTLAHUACUM** B.L. Turner, *sp. nov.*  
Fig. 1, Map 1

*Koanophyllon richardsonii* B.L. Turner similis sed differt laminis foliorum multo majoribus, capitulescentiis magis congestis, et receptaculis glabris (vs pubescentibus).

Shrubs 1-2 m high. **Mid-stems** minutely puberulent to glabrate. **Leaves** opposite throughout; blades broadly deltoid, 6-10 cm long, 4-7 cm wide, 3-nervate from the base, glandular-punctate beneath, sparsely hispidulous above, the margins irregularly serrate; petioles 2.0-3.5 cm
long. **Capitulescence** a terminal congested corymbose panicle of numerous heads, 3-6 cm high, 4-6 cm across, the ultimate peduncles 2-5 mm long. **Heads** ca 7 mm high. **Involucres** ca 4 mm long, composed of ca 11 slender, nearly glabrous, subequal bracts, their apices gradually attenuate. **Receptacles** ca 1 mm across, glabrous or nearly so. **Florets** 13-16 per head; corollas white, glabrous, ca 5 mm long, the lobes ca 0.5 mm long. **Achenes** 2.3-3.0 mm long, markedly hispidulous, especially along the ribs; pappus of ca 40 tawny-white bristles 4-5 mm long.

**TYPE:** MEXICO. OAXACA: Mpio. Coixtlahuaca, "Concepcion Buena Vista. Km 94.7 de la carretera Tehuacan-Oaxaca (cuota) y de este punto aproximadamente 2 horas a pie montana arriba hasta base de paredes verticales en la cima de cerro." 1680 m, (18°06'58.5 N, 97°19'47.1 W), 27 Oct 1996. Jose L. Panero & Ismael Calzada 6760 (Holotype: TEX).

The present novelty, in habit and leaf shape, resembles a species of *Fleischmannia*, but it clearly belongs to *Koanophyllon*, where it finds no clear relatives. Panero identified the type as *K. gracilicaule*, which it superficially resembles.

The species is named for the Municipio Coixtlahuaca, from whence the type.

In my account of *Koanophyllon* for Mexico (Turner 1997), I treated all of the latter within a broadly circumscribed *Eupatorium*. I now follow the treatment of King and Robinson (1987). Below find a modified key to the Mexican species of *Koanophyllon*, including the three novelties described herein.

**KOANOPHYLLUM CONCORDIANUM** B.L. Turner, sp. nov., Fig. 2., Map 1

*Koanophyllon reyrobinsonii* B.L. Turner similes sed differt foliis ovalibis (vs ovatis vel deltoideis ad medium latissimis et flosculis per capitulum paucioribus (4-5 vs 7 vel plures).
Perennial suffruticose herb or sprawling subshrub to 1 m (?) high. Stems densely pubescent with mostly upswept hairs. Leaves opposite, 5-7 cm long, 3-5 cm wide; petioles 3-6 mm long; blades oval, widest near the middle, 3-nervate from the base, nearly glabrous and atomiferous-glandular below, glabrous above, the margins pubescent, crenulate. Capitulescence a terminal corymbose panicle ca 15 cm high, 6-10 cm across, the ultimate peduncles 1-6 mm long, pubescent like the stems. Involucres 3-4 mm high, composed of 5-6 subequal, glandular-atomiferous bracts. Receptacles ca 0.5 mm across, pubescent. Corollas white, atomiferous-glandular, ca 2.5 mm long; tube ca 1.5 mm long; lobes 5, obtuse, ca 0.2 mm long. Achenes black, 5-ribbed, ca 1.5 mm long, appressed-pubescent; pappus of ca 30 persistent bristles ca 5 mm long.


This novelty is markedly distinct, having the pubescent receptacles of those taxa centering about K. longifolium and K. reyrobinsonii, but possessing the capitulescence and heads of K. palmeri, to which it is perhaps more closely related.

The species is named for the Municipio de Concordia, from whence the type.

KOANOPHYLLON REVEALII B.L. Turner, sp. nov., Fig. 3, Map 2

Koanophyllum gracilicaule (Sch.-Bip. ex B.L. Rob.) King & H. Rob. similes sed differt capitulescentiis minoribus (6-12 mm altis 6-12 mm latis vs ca 20 cm altis 20 cm latis) pedunculis ultimis brevioibus (3-6 mm longis vs 8-15 mm) et setis pappi numeros (ca 40 vs 20).
Shrub or small tree 1-4 m high. Mid-stems purplish-brown, minutely hispidulous. Leaves opposite throughout; blades ovate to ovate-deltoid, 4-6 cm long, 2-4 cm wide, 3-nervate from the base, glandular-punctate, the margins crenulate; petioles 2-4 cm long. Capitulescence a terminal corymbose panicle, 6-12 cm high, 6-12 cm across, the ultimate peduncles hispidulous, mostly 3-6 mm long. Heads numerous, 6-7 mm high. Receptacles ca 1 mm across, glabrous or nearly so. Involucres 3-4 seriate, imbricate, 1-4 mm long, densely brown-hispidulous throughout, linear-lanceolate, their apices abruptly acute. Florets ca 15 per head. Corollas white, glabrous, ca 4 mm long, the lobes deltoid, ca 0.5 mm long. Achenes ca 2 mm long, subglabrous to sparsely hispidulous; pappus of ca 40 tawny persistent bristles 3-4 mm long.


In my treatment of the Koanophyllon complex for Mexico (Turner 1997) I included the above collections within K. gracilicaule (to which it is clearly related). The latter is typified by material from Tlacolula, Oaxaca (GH!), first collected by Ehrenberg in 1839. Koanophyllon revelii differs from the latter in having much smaller capitulescences, with shorter ultimate peduncles, somewhat smaller heads, and pappus with more numerous bristles, as noted in the above diagnosis. Distribution of the two taxa is shown in Fig.4.
The species is named for James L Reveal, Systematist extraordinare, still kicking up nomenclatural novelties and academic miscellany at the age of eighty. Bravo! May he dance on.

Eupatorium solidaginoides H.B.K.

Weak-stemmed, arching or clambering, shrubs 1-3 m high; stems striate, densely puberulent; leaves 6-10 cm long, 2-5 cm wide; petioles mostly 1.5-4.0 cm long; blades deltoid to decidedly cordate, 3(5)-nerved from at or near the base, densely minutely glandular-punctate beneath, glabrous except along the major veins, the margins crenulate to dentate; heads white, numerous in both terminal and axillary, loose or congested, corymbose racemes, the ultimate peduncles 2-10 mm long; florets 10-15 per head; achenes ca 2 mm long, the pappus of 40-50 bristles 2.5-3.0 mm long.

A widespread, highly variable, species but readily distinguished by its weak clambering stems and cordate leaves (rarely deltoid).

Two varieties are recognized in the complex for Mexico, as follows:

Ultimate peduncles 3-7 mm long; heads 5-7 mm high; eastern Mexico.................................................................var. filicaulis
Ultimate peduncles 1-3 mm long; heads 4-5 mm high; western Cps.................................................................var. solidaginoides

var. filicaulis (A. Gray) B.L. Turner, comb. & stat. nov. Map 3.

San, Ver, Oax, Cps and Guatemala southwards, in barrancas of montane cloud forests 20-2600 m; Nov-Feb.
In Mexico, the two varieties are quite distinct; in Central America, however, they appear to intergrade, especially in northern Guatemala (numerous specimens in and about Tikal, LL-TEX), hence my treatment of these at the varietal level.

var. **solidaginoides** Map 3.

The type of this taxon is from Ecuador. In Mexico, it is known only from Chiapas, the latter populations easily recognized from the typical var. by its much shorter ultimate peduncles and smaller heads. *Eupatorium solidaginoides* var. *armourii* B.L. Rob. (photoholotype FM!) from Palenque, Chiapas appears to be a form of this taxon having markedly deltoid leaves and somewhat larger heads. Additional field studies might show the name concerned worthy of recognition.

**Key to Mexican species of Koanophyllon**

1. Leaves 3-parted or trifoliolate on mid-stems (a few leaves simple along the upper stems)................................. **K. tripartitum**
2. Leaves all simple.................................................................(2)

2. Leaves pinnately veined................................. **K. pittieri**
2. Leaves with 3-5 principal veins from, or near, the base...........(3)

3. Heads arranged in ball-like clusters, the involucres with only 1 or 2 florets............................................................... **K. monanthum**
3. Heads not as above, the involucres with 4 or more florets...........(4)

4. Pappus about 0.5 mm long or less; heads in congested, spike-like, capitulescences, the ultimate peduncles mostly 0-1 mm long; Cps............................................................... **K. ravenii**
4. Pappus 2-7 mm long; heads in mostly open or loosely arranged capitulescences, the ultimate peduncles mostly 2-10 mm long...............................................................(5)
5. Leaves with petioles 1-4 mm long, the blades appearing to clasp; Ver…………………………………………K. pseudoperfoliatum
5. Leaves with petioles 3-40 mm long, the blades not appearing to clasp…………………………………………………………..…(6)

6. Petioles mostly 12-40 mm long.................................(7)
6. Petioles mostly 2-15(20) mm long............................(14)

7. Heads 8-10 mm high; achenes densely pubescent with soft appressed hairs; Baja Calif..........................K. peninsularis
7. Heads 4-7 mm high; achenes glandular or sparsely hispid; not in Baja Calif..........................…………………(8)

8. Heads 4-5 mm high.............................................(12)
8. Heads 6-8 mm high.............................................(9)

9. Receptacles glabrous or nearly so; Gue, Oax, Cps..............(11)
9. Receptacles pubescent; Tam to Hid.........................(10)

10. Leaves cordate; achenes hispid; Nue...........K. hintoniorum
10. Leaves ovate, obtuse or truncate at base; achenes to some degree glandular-pubescent............K. richardsonii

11. Involucral bracts densely pubescent, abruptly acute..................................................K. revealii
11. Involucral bracts sparsely pubescent, if at all, gradually attenuate........................................K. coaxtlahuacum

12. Capitulescence of axillary or terminal spike-like branches, the heads arranged in tight or loose interrupted corymb ......K. solidaginoides
12. Capitulescence not as above, terminal and leafy in pyramidal corymbose panicles.................................(13)

13. Blades of leaf pubescent above and below, (rarely glabrate); corollas 2.5-3.3 mm long; involucral bracts sharply acute; Chi, Sin.............................K. sinaloense
13. Blades of leaf glabrous or nearly so; corollas ca 3.5 mm long; involucral bracts broadly acute; San, Ver, Gue, Oax ..........................................................K. gracilicaule
14(6). Receptacle glabrous.............................................(17)
14. Receptacle decidedly pubescent, rarely not; Sin, Nue, Tam, San, Hid..........................................................(15)

15. Leaves oval, widest near the middle; florets 4-5 per head; Sin..............................................K. concordianum
15. Leaves ovate to triangular, widest near the base; florets 6-15 per head..........................................................(16)

16. Blades of leaf uniformly pubescent beneath; petioles mostly 7-15 mm long; corollas ca 2 mm long.........................K. longifolium
16. Blades of leaf sparsely pubescent along the major veins; petioles mostly 3-6(8) mm long; corollas 2.5-3.0 mm long
........................................................................K. reyrobinsonii

17. Suffruticose herbs or arching, weak, shrubs, 0.5-3.0 m high; older stems not white; foliage to some degree pubescent.....(19)
17. Tree-like shrubs, small trees or woody vines, 2-10 m high; older stems white; foliage glabrous........................................(18)

18. Woody vines; capitulescence pyramidal, axillary; leaf blades elliptic, 15-20 cm long; Gue..........................K. guerreroanum
18. Shrubs or trees; capitulescence corymbose or pyramidal, terminal; leaf blades ovate-elliptic, 6-15 mm long; widespread
........................................................................K. albicaule

19. Leaf blades densely pubescent above and beneath; San
........................................................................K. rzedowskii
19. Leaf blades not densely pubescent except along the veins beneath; widespread....................................................(20)

20. Leaf blades variously lanceolate, ovate, or deltoid, but not clearly cordate or subcordate.................................(22)
20. Leaf blades neatly cordate or subcordate..........................(21)

21. Involucral bracts rigid with narrowly acute (acicular) apices, not at all scarious; Nue..............................K. galeanum
21. Involucral bracts not rigid, scarious marginally, the apices obtuse or rounded; widespread but not in Nue
........................................................................K. solidaginoides
22. Leaves often alternate above, the blades epunctate beneath; e Chi, Coa, Dur, Zac…………………………..K. solidaginifolium

22. Leaves opposite throughout, the blades glandular-punctate beneath; Son, w Chi, Dur, Jal, Col, Mic…………………………………………………………(23)

23. Heads 7-9 mm high; Cps………………………………..K. coulteri
23. Heads 4-6 mm high; w Chi, Sin, Dur, Nay, Jal, Col, Mic, Gue …………………………………………………………………………K. palmeri

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LITERATURE CITED


Map 1. Distributions of K. coixthlahuacum and K. concordianum.
Map 2. Distributions of *K. gracilicaule* and *K. revealii*.

Map 3. Distributions of *K. solidaginoides* var. *filicaulis* and var. *solidaginoides*. 
Fig. 1. Holotype of *Koanophyllon coixtlahuacum*. 
Fig. 2. Holotype of *Koanophyllum concordianum*. 
Fig. 3. Holotype of Koanophyllum revealii.