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A taxonomic revision of *Acaciella* (Leguminosae, Mimosoideae)

by

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Abstract

The genus *Acaciella* Britton & Rose is reinstated. All species are neotropical with the highest species diversity along the Pacific coast of Mexico. The genus is characterised by three features exceptional in *Acacia* Miller: unarmed plants, lack extrafloral nectaries and pollen polyads 8-celled. With the exception of the number of stamens, *Acaciella* shares more features with the genus *Piptadenia* (tribe Mimoseae) than with *Acacia*. In terms of pollen and free aminoacids it is related to the pantropical *Acacia* subgen. *Aculeiferum*. Molecular studies place *Acaciella* sister to a monophyletic clade comprising elements of the mainly Australian *Acacia* subgen. *Phyllodineae,* and the pantropical tribe *Ingeae*. The 85 validly published names in *Acaciella* are referred here to 15 accepted species and five varieties. One new species and one variety are described, and two new names and five new combinations proposed. Twenty one names are lectotypified. Keys, descriptions, illustrations, distribution maps and conservation status for the 20 taxa are given.

Keywords: *Acacia*, *Acaciella*, conservation, Leguminosae, Mimosoideae, neotropical.

Resumen

Se restablece el género *Acaciella* Britton & Rose. Todas las especies son de origen neotropical con su máxima diversidad en la costa del Pacífico de México. El género se caracteriza por tres aspectos morfológicos, que son excepciones del género *Acacia* Miller: plantas completamente inermes, ausencia de nectarios extraflorales y políades con 8 granos de polen. La única característica que lo mantenía dentro del género *Acacia* Miller era el número de estambres. *Acaciella* comparte más caracteres con el género *Piptadenia* (tribu Mimoseae). En lo que refiere al polen y aminoácidos libres se encuentra emparentado con *Acacia* subg. *Aculeiferum*. Los datos moleculares sugieren que *Acaciella* es grupo hermano del clado formado por los táxones *Acacia* subgen. *Phyllodineae* y la tribu pantropical *Ingeae*. Los 85 nombres publicados como *Acaciella* son tratados aquí como 15 especies y cinco variedades. Se proponen una nueva especie, una nueva variedad, dos nombres nuevos y cinco nuevas combinaciones. Se lectotipifican 21 nombres. Se proporcionan claves para la identificación de las especies, ilustraciones, mapas de distribución y catagorías de conservación para 20 táxones.

Palabras clave: *Acacia*, *Acaciella*, conservación, Leguminosae, Mimosoideae, Neotrópico.

Introduction

Since Britton & Rose (1928) *Acaciella* has been included in a broad *Acacia sensu lato* because its flowers have numerous free stamens, sometimes more than 300. It is equivalent to *Acacia* subgenus *Aculeiferum* section *Filicinae* Bentham.

Acacia s.l. has been the only genus in the tribe Acacieae (Polhill, 1994); although similarities in flower morphology of *Acacia s.l.* are with the genera *Leucaena, Piptadenia* and *Mimosa* (tribe Mimoseae) and *Enterolobium* and *Lysiloma* (tribe Ingeae). At present *Acacia s.l.* is the second largest genus of the Leguminosae, with more than 1450 species in both tropical and temperate regions (Lewis, 2005). The tribe Acacieae is characterised by having flowers with many stamens, more than twice as many as the corolla lobes, with the filaments free or basally adherent to the corolla to form a short stemonozone. Exceptionally, in the male flowers of some neotropical species, a reduced staminal tube has been found, e.g. in *Acacia albicorticata* Burkart*, A. hindsii* Benth., *A. farnesiana* (L.) Willd. and *A. picachensis* T.S. Brandegee. In *Acaciella* a nectary ring is found between the stamens and the ovary, and this is a character shared with *Acacia* subgenus *Aculeiferum*.

The circumscription of *Acacia* is currently undergoing radical modification. Following the classical

studies by Bentham (1875) a broad circumscription of the genus was maintained by most workers, with the principal exception of Britton & Rose (1928) who divided the species in North and Central America and the West Indies into 12 genera. Guinet & Vassal (1978) divided *Acacia* into three subgenera and a number of sections. Since the 1970s research on the pollen, secondary metabolites, gums, seeds and seedlings has revealed significant differences which led Pedley (1986) to propose that *Acacia* should be divided into three genera. He gave a comprenhensive review of characters based on morphology, free aminoacids, phyllode structure and pollen. He considered that the characters showed enough variation amongst Vassal's subgenera to justify raising these to genera, namely *Acacia*, *Senegalia* (≡ subgenus *Aculeiferum*) and *Racosperma* (= subgenus *Phyllodineae*). Maumont (1990), studying seed anatomy, found characters that supported Vassal's subgenera, and remarked that sect. *Filicinae*, represented by *A. boliviana* (= *A. angustissima*), showed a 'particular unique set of characters'. Clarke & al. (2000), in a molecular analysis, included a single species, *A. angustissima,* of section *Filicinae*. In their study this species was found to be sister to tribe *Ingeae* and both were grouped in the clade with the African-American subgenus *Aculeiferum*. Although only one species of section *Filicinae* was included, the branch length for this species was the one with more character changes in the published cladogram (Clarke & al., 2000: 627), indicating how different this section is within genus *Acacia*. Robinson (1996) and Robinson & Harris (2000), based on a molecular analysis of amphitropical species, concluded that *Acacia s.l.* is polyphyletic since subgenus *Phyllodineae* is sister to tribe Ingeae; on the other hand they concluded that subgenera *Aculeiferum* and *Acacia* are clearly monophyletic. Four species of section *Filicinae* were included in the analysis and formed a well supported monophyletic group, sister to subgenus *Aculeiferum*. Branch length for the *Filicinae* was 42 steps; the longest in the whole cladogram (Robinson & Harris, 2000: 203). Luckow & al. (2002: 209) found that *Filicinae*, represented by *Acacia boliviana* Rusby, is sister to the tribe *Ingeae*.

Murphy & al. (2003) studied three chloroplast DNA regions: psbA-TrnH intergenic spacer, the trnL intron and the trnL-trnF intergenic spacer. Their ingroup was subgenus *Phyllodineae*. They did not include any species of section *Filicinae*.

Section *Filicinae*, molecularly and morphologically, is a very discrete group of species, especially compared with the current lack of evidence for monophylly in some other groups within the genus *Acacia,* except for *Acacia s*ubgenus *Acacia* (Luckow & al., 2003). All this gives support to recognising the Section *Filicinae* as a discrete genus and reinstating the name *Acaciella* Britton & Rose which is the earliest available name for the taxon.

Acaciella occurs widely from the southern USA to Argentina (Fig. 1), but with no native species in Brazil although recently *A. angustissima* seed has been planted in experimental forestry plots (Brienza & al. 2000). Most of the species occur only in Mexico, where species occupy a wide range of habitats from near sea-level to 2,500 m. These include *Pinus-Quercus* forest, semi-desert and seasonally dry forest. The species are tolerant of a wide range of soil types. *Acaciella angustissima* and *A. villosa* are distributed from southern USA to Bolivia, Colombia, Peru, Ecuador and Argentina. These two form an important natural browse resource and have been cultivated for this purpose in other parts of the world.

Acaciella history

Bentham (1842) listed 11 species in his series *Filicinae*. Taubert (1894) and Guinet & Vassal (1978) placed this series under genus *Acacia* subgenus *Aculeiferum* section *Filicinum* series *Filicinae,* without listing the species. Britton & Rose (1928) proposed a new genus, *Acaciella*, for species previously included in *Filicinae*. They recognised 53 taxa and assigned *Acacia villosa* as the type species. Pedley (1978) followed Guinet and Vassal's classification to some extent, but in 1986 he divided *Acacia* into three genera, including section *Filicinae* within *Senegalia* (Pedley, 1986). Since Britton & Rose (1928), contributions to *Acaciella* have been limited to descriptions of new taxa within the genus *Acacia* (e.g. Wiggins, 1942; Sherve & Wiggins, 1964; Standley, 1919, 1922; Isely, 1969, 1998; Turner, 1996), or in a few cases within *Senegalia* (Pittier 1939; Pedley 1986). To date, there are at least 85 names that belong in the genus *Acaciella*.

Pedley (1978) formalised section *Filicinae* within genus *Acacia*, he proposed *Acacia filicina* Willd. as the type for this section based on Taubert's (1894) citation "*A. villosa und A. filicina*". Later Pedley (1986) placed *Acacia* series *Filicinae* Benth. within his concept of the genus *Senegalia* Britton & Rose as section *Filicinae* (Benth.) Pedley.

Material and methods

This taxonomic treatment was based on the study of more than 1250 herbarium specimens. The materials are deposited in the following herbaria: B, BM,

BOLV, BR, CIIDIR, ENCB, IEB, FCME, FHO, G, GH, HAC, HAJB, IBUG, JBSD, K, LL, LPB, M, MAD, MEXU, MO, NY, OXF, TEX, U, US, USZ, W, XAL (herbarium acronyms are abbreviated according to Holmgren & *al.*, 1998). *The full list of materials included in this study can be provided by the first author.* All type material seen by the first author is indicated by ! Species descriptions follow a standard format in which we include the relevant features of the genus. Study of seedlings and living materials grown at Kew, as well as field observations (by the first author) in Belize, Bolivia, Cuba, Dominican Republic, Mexico and Venezuela were taken into account during taxonomic decision-making. The descriptions were based on completed score sheets for each species; these were specially designed to include characters present in the genus following format details as suggested by Radford & al. (1974). A representative number of specimens, at least 10, was scored to include the complete morphological range of the materials. Indumentum terminology largely follows the definitions of Lawrence (1951). Descriptions of leaflet shapes are based on the symmetric plane figures of the Systematics Association Committee (1962) and the types of venation follow Hickey (1973). Cited collections are arranged alphabetically first by country, next by state, department or district, and finally by collector name and number.

Label data from each specimen studied was stored in a database using the computer programme BRAHMS (V5.6202). Reports and outputs were used to produce a list of numbered exsiccatae; the representative number of specimens; and a file with coordinates to construct the distribution maps.

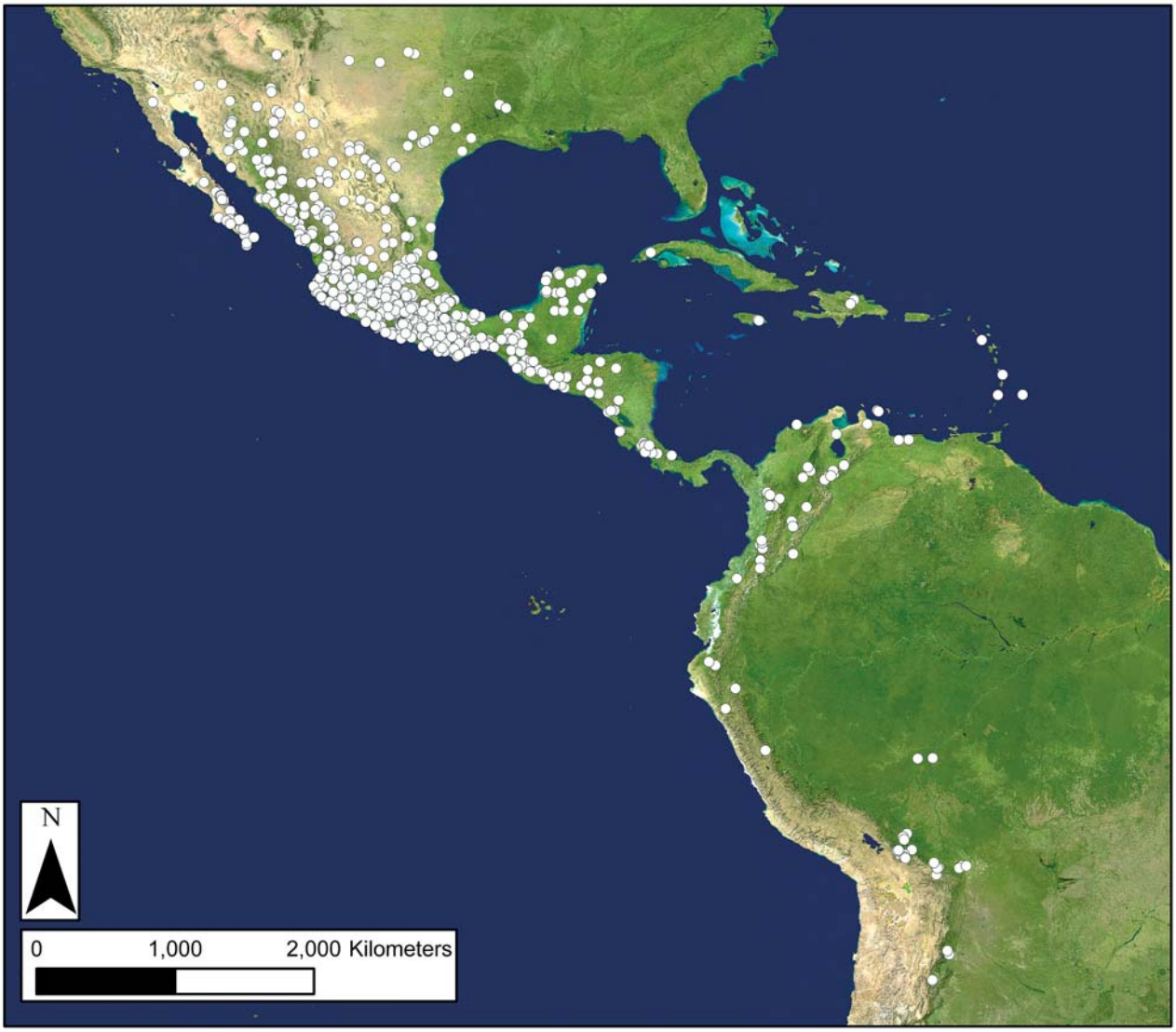

Fig. 1. Geographical range of the genus *Acaciella* in the neotropics.

Conservation status follows IUCN categories and criteria (IUCN version 3.1, 2001). Preliminary conservation assessments were inferred from georeferenced specimen data analysed within a Geographical Information System (GIS). The initial analyses were based on measurements of range, namely Extent of Occurrence (EOO) and Area of Occupancy (AOO); for details see Willis & al. (2003). These were then followed by a more detailed assessment incorporating further GIS analysis, literature searches and consultation of specialists and experts.

Characters of the genus *Acaciella*

The genus lacks prickles, spines, vegetative nectaries and staminal glands. The only feature that retained *Acaciella* within *Acacia s.l.* was the number of stamens; these are sometimes more than 300 per flower and always free.

Habit

Most are shrubs or small trees to 12 m (Bolivian records), but at least two species: *Acaciella tequilana* var. *tequilana* and *A. hartwegii* are perennial herbs. They are never lianas in contrast to most species of subgenus *Aculeiferum* section *Aculeiferum* (≡ *Senegalia p.p.*). *Acaciella* species are unarmed and lack nectaries on their leaves. Some species seem to proliferate more successfully after fire, for example, there are reports of *Acaciella tequilana* var. *tequilana* being pyrophytic.

Stipules

These are usually fugacious (although tending to be persistant in *A. angustissima*), linear, triangular, elliptic or narrowly elliptic, to broadly lanceolate in outline, and from 1-5(10) mm long. Unfortunately, stipules are usually absent on herbarium specimens.

Leaves

These are always bipinnately compound, with two to more than 25 pairs of pinnae. Leaves closer to the inflorescences tend to have fewer pinnae than those on the mature branches. The leaflets range from few to numerous (2-60) per pinna. Leaflet sizes fall into two categories: microphyllidious (very small) from 2-12 mm long and 1-3 mm wide, or macrophyllidious, greater than 12 mm long and 6 mm wide. To date, the species with the largest known leaflets is *Acaciella rosei*, in which leaflets range from 3-6.5 cm long and (0.9)1.2-3 cm wide. Paraphyllidia are present in all *Acaciella* species: these are a pair of minute appendages, just above the pinna pulvinulous. Paraphyllidium (plural paraphyllidia) was a term formalized in the monograph of *Mimosa* by (Barneby, 1991); according to Barneby, paraphyllidia are analogous to stipels in the phaseoloid legumes, in this latter case genuine appendages that subtend the pulvinule of a leaflet. Based on observations of seedling morphology, these paraphyllidia may represent rudimentary leaflets; paraphyllidia are illustrated in several figures in this revision.

Inflorescence

The basic inflorescence type is a dense, compact raceme, most commonly capitulum-like, but sometimes elongated into a short raceme. However, this elongation seems to be a sporadic variation within some of the widespread taxa, for example, in *Acaciella painteri* var. *houghii*. *Acaciella* flowers are similar to those of *Piptadenia* species in the tribe *Mimoseae*; the pedicels are usually glabrous, persist after the flowers have fallen, and infrequently are slightly pubescent. Flowers are always subtended by a small bract, broad or clavate in shape, usually glabrous and fugacious, visible in the early stages of bud development. This bract is usually longer than the calyx. By the time the pedicel develops, the floral bracts have fallen.

Flowers

Calyx and corolla are very homogeneous throughout the genus; flowers have been recorded as white, whitish or cream-coloured, less often greenish. When dried, the calyx and corolla appear cream, yellow, orange or pink. Usually the calyx is 5-lobed (the lobes up to ¼ of the calyx length) occasionally almost truncate. The corolla is deeply 5-lobed, to more than ½ of its length. Calyces and corollas are usually glabrous. The stamens are always free and more than 200 per flower in number. The ovary is usually glabrous, with a stipe of at least ¼ the length of the ovary. In all species an ovary disc is present at the stipe base. The style is usually longer than the stamens or less often, equal to them.

Legume

The pod is flat, straight, usually glabrous and dehiscent along both sutures. It is usually membranous in texture and strongly reticulate-veined. It is characterised by a long apical beak and a basal stipe, the latter usually more than 1 cm long; the stipitate fruits resemble those of the genus *Piptadenia*.

Seeds

The seeds are almost circular in outline, lenticular to spherical and dark brown; the pleurogram area is usually more prominent than the rest of the seed, while the funicule is very inconspicuous, almost absent.

Seedlings

Germination is epigeal, with thin, flat cotyledons. The first pair of eophylls are opposite, and the next, alternate. The first true leaf is simply pinnate, the second, bi-pinnate. The numbers of pinnae and leaflets increase progressively until the plant produces its mature leaves.

Pollen

Pollen is in polyads. These are porate and 8-grained (bitetrads). They have two joined hemispheric tetrads: each grain has 3 pores, two central pores in contact with each other (Caccavari & Dome, 2000). The tectum is very shallowly reticulate, continuous and not perforate in the lumen (Rico & Banks, 2000), with the foot layer absent or vestigial. Caccavari & Dome (2000) described a vestigial interrupted foot layer. This type of tectum, and the vestigial or absent foot layer, is unique for *Acaciella* species; this feature separates the genus from the pollen of the rest of *Acacia s.l.* The endexine is generally thicker or equal in thickness to the combined tectum and infratectum. *Acaciella* polyads are similar to some *Mimosa* polyads, e.g. *M. malacophylla* A. Gray, as shown in the following Web site: http://pollen.usda.gov/AtlasSEMPlates/ .

Chromosomes

The basic chromosome number is x=13 (reported in *Acacia texensis*, Isely, 1973); Goldbatt's IPCN (http://mobot.mobot.org/W3T/) and Goldblatt & Johnson (2003), do not register any other species of *Acaciella* or *Acacia* sect. *Filicinae*.

Utilization

Agroforesters have tested *Acaciella angustissima* which coppices readily outside its natural range. Trees are fast-growing in experimental plots and are more productive in terms of both foliage and young branches than *Calliandra houstoniana* var. *calothyrsus* reported (as *C. calothyrsus*) by Brook (1992). However, the wood of *A. angustissima* was weak, branches tended to drop on lower crops, and break even with slight winds. Nevertheless, *A. angustissima* looks to be a promising multipurpose tree. Plants of *A. angustissima* have been introduced into different countries for experimental trial plots; results have been reported by Dzowela (1994) and more recenly by Brienza & al. (2000, 2000b). In terms of nitrogen fixation only *A. angustissima* and *A. villosa* have been reported to nodulate by Sprent (2001).

Cultivated specimens of *A. bicolor*, *A. glauca* and *A. villosa* growing outside the American continent (in Australia, Borneo and China) have been found in herbaria, but these carry no additional data.

Conservation

The conservation status of most species presented here has not been fully assessed before, although Rico & Fonseca (2005) discussed, and provided data for 8 species in Guerrero, Mexico. In the current paper the conservation status of all 20 taxa are assessed according to the IUCN categories and criteria (IUCN version 3.1, 2001). The results for all *Acaciella* are summarised in Table 1.

Table 1. *Acaciella* species and their conservation categories according to IUCN (2001); explanation and more details are given at the end of each taxon.

A. angustissima (Mill.) Britton & Rose var. *angustissima*	Least Concern (LC)
A. angustissima var. *filicioides* (Cav.) L. Rico	Least Concern (LC)
A. angustissima var. *texensis* (Nutt. ex Torrey & A. Gray) L. Rico	Least Concern (LC)
A. barrancana (H. Gentry) L. Rico	Data Deficient (DD)
A. bicolor Britton & Rose	Vulnerable (VU)
A. chamelensis (L. Rico) L. Rico	Vulnerable (VU)
A. glauca (L.) L. Rico	Least Concern (LC)
A. goldmanii Britton & Rose	Least Concern (LC)
A. hartwegii (Benth.) Britton & Rose	Near Threatened (NT)
A. igualensis Britton & Rose	Least Concern (LC)
A. lemmonii (Rose) L. Rico	Near Threatened (NT)
A. painteri Britton & Rose var. *painteri*	Near Threatened (NT)
A. painteri var. *houghii* (Britton & Rose) L. Rico	Least Concern (LC)
A. rosei (Standl.) L. Rico	Least Concern (LC)
A. sotoi L. Rico	Critically Endangered (CR)
A. sousae (L. Rico) L. Rico	Vulnerable (VU)
A. tequilana (S. Wats.) Britton & Rose var. *tequilana*	Least Concern (LC)
A. tequilana var. *crinita* (Rose) L. Rico	Near Threatened (NT)
A. tequilana var. *pubifoliolata* L. Rico	Endangered (EN)
A. villosa (Sw.) Britton & Rose	Least Concern (LC)

Taxonomy

Acaciella Britton & Rose, N. Amer. Fl. 23: 96. 1928.
Type species: *Acacia villosa* (Sw.) Willd., Sp. Pl. 4: 1067. 1806. *Mimosa villosa* Sw., Fl. Ind. Occ. 2: 982. 1800.
Acacia series *Filicinae* Benth., London J. Bot. 1: 322. 1842. *Acacia* sect. *Filicinae* (Benth.) Taub., Pflanzenf. 3: 113. 1894. *Senegalia* sect. *Filicinae* (Benth.) Pedley, Bot. J. Linn. Soc. 92: 238. 1986.
Type species: *Acacia filicina* Willd. Sp. Pl. 4: 1072. 1806.

Mostly slender shrubs or small trees and less frequently perennial herbs, unarmed, glabrous or pubescent. Stipules fugacious or persistent, glabrous or ciliate. Leaves bipinnate. Petiole without glands. Pinnae two to many pairs, leaflets few to many pairs. Inflorescences compound in large open panicles, sometimes up to 60 cm long, more frequently in short fascicles of capitulum-like racemes; flowers pedicellate, aggregated in heads or very short, globose to oblong racemes. Legume flat, linear to narrowly oblong; valves thin, membranaceous or papyraceous, dehiscent and splitting from the apex downwards, not separating into layers, stipe present and always central to the legume base. Seeds not longer than broad, lenticular in outline, to almost spherical, the axis at right angles to the legume; funicule slender, pleurogram 90 %, conspicuous. Seedlings epigeous; first pair of pinnae opposite, next alternate; first true leaf once pinnate, next twice pinnate. Pollen in 8-celled polyads.

Chromosome numbers: $2n = 26$ (Isely, 1973)

KEY TO THE SPECIES OF *ACACIELLA*

1. Leaflets large, more than 25 mm long, ovate-rhombic to oblong, elliptic or suborbicular 2
1. Leaflets small, 3(8) mm long, usually linear to linear-oblong. 5
2. Leaflets usually fewer than 8 pairs per pinna..... 3
2. Leaflets (6)14-30 pairs per pinna ..... **14. A. tequilana**
3. Leaflets 2-3 pairs per pinna, 3-6 cm long, broadly obovate .. ..**13. A. sousae**
3. Leaflets 4-8 pairs per pinna, 1.5-2.5 cm long, ovate 4
4. Stipules to 10 mm long, leaflets ovate-rhombic, densely pubescent ..... **12. A. sotoi**
4. Stipules 2-2.5 mm long, leaflets elliptic to widely-elliptic, glabrous ..... **11. A. rosei**
5. Perennial herb, usually prostrate..... **7. A. hartwegii**
5. Shrubs or small trees 6
6. Leaflets with only one vein, prominent or faintly visible 7
6. Leaflets with reticulate or brochidodromous venation or pinnately veined 11
7. Stipules conspicuous, persistent, 1 mm wide; leaflets somewhat discolorous and glabrous (Baja California endemic) .... **6. A. goldmanii**
7. Stipules inconspicuous, usually fugacious, usually less than 0.5 mm wide; leaflets glabrous, pubescent or glabrescent 8
8. Leaflets with an indument on both surfaces, usually densely long-strigose on both surfaces (restricted to the Pacific Coast of Mexico, Guerrero, Oaxaca and Puebla states) .... **3. A. bicolor**
8. Leaflets sparsely short-strigose, mainly on lower surface, the upper surface glabrous, glabrescent, the margin ciliate (widespread elswhere) 9
9. Margin of the leaflets plane ..... **1. A. angustissima**
9. Margin of the leaflets involute at least at the leaflet base . 10
10. Whole margin of the leaflets involute, obscuring the midvein (widely distributed, from Mexico to Panama and in Peru) ..... **15. A. villosa**
10. Margins of the leaflets thickened and if involute only on the basal part, the rest tends to be plane; (species restricted to the the Caribbean and N Venezuela) ..... **5. A. glauca**
11. Plants with leaflets 4-7 mm wide (restricted to Jalisco and Colima, Mexico) ..... **4. A. chamelensis**
11. Plants with leaflets < 3 mm wide (widespread elsewhere)... 12
12. Leaflets with inconspicuous reticulate venation or seldom with only the midrib (restricted to the SE USA and N Mexico) ... 13
12. Leaflets with conspicuous reticulate venation (restricted to C and SW Mexico) 14
13. Plants with paraphyllidia to 2 mm long; 30-50 pairs of leaflets per pinna (endemic to Durango and Chihuahua states, Mexico) ..... **2. A. barrancana**
13. Plants with paraphyllidia 0.75-1 mm long; 14-20 pairs of leaflets per pinna (elsewhere in SE USA and northern Mexico) ..... **9. A. lemmonii**
14. Inflorescences in axillary clusters or fascicles of (2)4-5 heads ..... **7. A. hartwegii**
14. Inflorescences in open panicles on a long terminal axis, 8-32 cm long 15
15. Twigs, rachises and petioles long-pilose, the hairs yellowish; leaflets long-ciliate ..... **8. A. igualensis**
15. Twigs, leaflets and rachises glabrous or nearly so, or shortly white-pubescent, or short-hirsute, never pilose .... **10. A. painteri**

The species in this revision are presented in alphabetical order. In some instances putative relationships for a taxon are given in a taxonomic comments section.

1. Acaciella angustissima (Mill.) Britton & Rose, N. Amer. Fl. 23: 100. 1928.

Mimosa angustissima Mill., Gard. Dict. ed 8 no. 19. 1768. *Acacia angustissima* (Mill.) Kuntze, Rev. Gen. Pl. 3: 47. 1896. *Senegalia angustissima* (Mill.) Pedley, Bot. J. Linn. Soc. 92(3): 238. 1986. *Mimosa ptericina* Poiret, Encycl. Suppl. 1: 74. 1810. nom. illeg., equated by Woodson & Schery (1950) with *Acacia angustissima* (Mill.) Kuntze.

Type: Mexico, Vera Cruz [Veracruz], 1731, *Houston s.n.* [*holotype*, BM!, *fide* McVaugh, 1987: 124), photographs of type MEXU!, US! ex BM].

Acacia angustissima subsp. *typica* Wiggins, Contr. Dudley Herb. 3: 229. 1942, nom.inval.

This is a very variable taxon and contain a number of varieties. Wiggins (1942), Turner (1996) and Isely (1973, 1998) studied the variation in the South Eastern United States. Many of the varieties have been placed in synonymy. When shrubs grow in limestone soils, the pinnae tend to be long and numerous whereas specimens growing in acid soils, most usually in *Pinus* forest, have shorter pinnae and the leaflets closer together, producing a feather-like aspect to the foliage.

KEY TO THE SPECIES OF *ACACIELLA*

1. Plants usually glabrous or glabrescent; leaflets glabrous or with short cilia; pinnae less than 6 (rarely to 8) pairs per leaf .... **1c.** var. **texensis**
1. Plants pubescent, very rarely glabrous throughtout; leaflets glabrous or pubescent; pinnae 7 or more pairs per leaf..... 2
2. Twigs, petioles and rachises densely or sparsely hispid or pilose-pubecent, hairs usually yellow; pinnae usually 18-32 pairs; fruit without a beak ..... **1b**. var. **filicioides**
2. Twigs usually glabrous, or puberulous, if pubescent, different to above; pinnae usually 11-17 pairs; fruit with a long beak (to 5 mm long) ..... **1a.** var. **angustissima**

1a. Acaciella angustissima (Mill.) Britton & Rose var. **angustissima**

Acacia angulosa Bertol., Fl. Guatimal. 4: 442. 1840. *Acaciella angulosa* (Bertol.) Britton & Rose, N. Amer. Fl. 23: 100. 1928.

Type: Guatemala: 'ex vulcano d'acqua', *J. Velásquez s. n.* (lectotype, designated here, BOLO Bertol. Herb., Microfiche IDC 47.I.6!).

Acacia elegans M. Martens & Galeotti, Bull. Acad. Roy. Sci. Bruxelles 10: 312. 1843, non *A. elegans* Schldl., Linnaea 12: 569. 1838, equated with *A. angustissima* by Rudd (1984:137).

Type: Mexico: Oaxaca, San Felipe, Cordillera, Oaxaca, *H. Galeotti 3203* (lectotype, designated by Rudd, 1984, BR!; isolectotype, K!) .

Acacia insignis M. Martens & Galeotti, Bull. Acad. Roy. Sci. Bruxelles 10: 313. 1843, non *A. insignis* Hoffmanns (1824).

Type: Mexico:Veracruz, Cordillera, 1840, *H. Galeotti 3303* (lectotype, designated here, BR!; isolectotypes, G!, K!).

Acacia boliviana Rusby, Bull. New York Bot. Gard. 4: 348. 1907.

Type: Bolivia: *Bang 2070* (lectotype designated here, NY!; isolectotypes, BM!, US).

Acacia suffrutescens Rose, Contr. U.S. Nat. Herb. 12: 409. 1909. *Acaciella suffrutescens* (Rose) Britton & Rose, N. Amer. Fl. 23: 103. 1928. *Acacia hirta* var. *suffrutescens* (Rose) Kearney & Peebles, J. Wash. Acad. Sci. 29: 482. 1939. *Acacia angustissima* var. *suffrutescens* (Rose) Isely, Sida 3: 372 (1969); equated by Isely (1998) with *Acacia angustissima* var. *hirta* (Nutt.) B.L. Robinson.

Type: USA: Arizona, Santa Cruz Valley, *Pringle 1881* (holotype, US!, number 41086).

Acaciella breviracemosa Britton & Rose, N. Amer. Fl. 23: 99. 1928.

Type: Mexico: Jalisco, near Guadalajara, 1886, *E. Palmer 647* (lectotype, designated here, US!; *isolectotype,* NY).

Acaciella delicata Britton & Rose, N. Amer. Fl. 23: 100. 1928. *Acacia delicata* (Britton & Rose) Bullock, Bull. Misc. Inform Kew 1939(1): 1. 1939.

Type: Mexico: Guerrero, Acapulco vicinity, 1894-1895, *E. Palmer 298* (lectotype, designated here, NY!; isolectotype, K!, US).

Acaciella costaricensis Britton & Rose, N. Amer. Fl. 23: 101. 1928. *Acacia pittieriana* Standl., Pub. Field Mus. Nat. Hist., Chicago, Bot. Ser., 13: 489. 1937; non *Acacia costaricensis* Schenck. 1913.

Type: Costa Rica: San José, Santa María de Dota, Dec. 1925, *P.C. Standley 41877* (lectotype designated by Standley 1937, NY!; isolectotype, US!).

Acaciella rensonii Britton & Rose, N. Amer. Fl. 23: 101. 1928.

Type: El Salvador: vicinity of San Salvador,-II-20, 1904, *C. Renson 115* (holotype, US; isotype, NY!).

Acaciella ferrisiae Britton & Rose, N. Amer. Fl. 23: 101. 1928.

Type: Mexico: Nayarit, Tres Marias Islands, Maria Madre, 22 Oct. 1925, *R.S. Ferris 5610* (holotype, US!; isotypes, DS, NY!).

Acaciella talpana Britton & Rose, N. Amer. Fl. 23: 101. 1928.

Type: Mexico: Jalisco, near Talpa, 7-III-1897, *E.W. Nelson 4039* (holotype, US!; isotype, GH!).

Acaciella smithii Britton & Rose, N. Amer. Fl. 23: 101. 1928. *Acacia angustissima* subsp. *smithii* (Britton & Rose) Wiggins, Contr. Dudley Herb. 3: 232 (1942). *Acacia angustissima* var. *smithii* (Britton & Rose) L. Rico, Anales Jard. Bot. Madrid 58: 258. 2001.

Type: Mexico: Oaxaca, Monte Alban, *C.L. Smith* 349 (holotype, US!; isotype, NY!).

Acaciella ciliata Britton & Rose, N. Amer. Fl. 23: 101. 1928.

Type: Mexico: Oaxaca, near 'La Paradis', *E.W. Nelson 995* (lectotype, designated here, US!; isolectotypes, GH!, NY!).

Acaciella santanderensis Britton & Killip, Ann. New York Aca. Sci.: 140. 1938.

Type: Colombia: Norte de Santander, between Pamplona and La Isla, 27 Feb. 1927, *Killip & Smith 19791* (holotype, NY!; isotypes, US!, K!).

Shrub or *tree* up to 3(12) m tall, twigs glabrous. *Stipules* linear, 2-2.5 mm long, persistent. *Leaves* 10-13.5(21) cm long; petiole 1.2-2(3.5) cm long, upper region channelled, sparsely strigulose; rachis 6.5-8 cm long, sparsely strigulose, glabrous with age, with 11-17 pairs of pinnae, sparsely strigulose; pinnae 2.5-4(5) cm long; paraphyllidia up to 3 mm long; leaflets 20-40 pairs per pinna, 2.4-3.2 × 0.5 mm, linear, base auriculate, apex acute, only the midvein evident on the lower surface, glabrous, shortly ciliate, membranous. *Inflorescences* consisting of axillary fascicles; peduncles 1-1.3(1.5) cm long, glabrous but sometimes with sparse pearl glands; one inflorescence bract below each raceme, 1 mm long, glabrous, very broadly ovate, caducous, leaving a protuberant scar; floral bract 1.3 mm long, glabrous, clavate, caducous; pedicels 0.6-0.8 mm long, glabrous; flowers white; in short capitulum-like racemes up to 1.5 cm diam. at anthesis. *Calyx* 0.5-0.8 mm long, 5-lobed (the lobes less than 1/4 the length of the calyx), glabrous. *Corolla* 4.5 mm long, 5-lobed (the lobes more than half corolla length), glabrous. *Stamens* 6 mm long. *Ovary* 1.2 mm long, glabrous, shortly stipitate, the stipe shorter than the ovary, with a basal nectary 0.5 mm high. *Legume* 4-9 × 1-1.5 × 0.17-0.2 cm, flat, straight, valves chartaceous, conspicuously reticulate, glabrous, acute at the base and apex; stipe 0.7-1.2 cm long; beak 2-5(7) mm long, straight or curved. *Seeds* 8-12 per fruit, circular in outline, spherical (2.6)2.9-3.2 × 2.5-3 × 1.7-2 mm. Fig. 2.

Distribution. Found naturally from the United States of America, south through Mexico and Central America to Venezuela, Colombia, Peru, Ecuador, Bolivia and Argentina. It has not been recorded from the Guianas, Uruguay and Paraguay, but it may have been introduced there for forestry trials. Found cultivated in Brazil and the Dominican Republic. Introduced to Australia, Thailand, Indonesia, the Philippines, and Papua New Guinea. Fig. 3., materials outside the American Continent are not included in Fig. 3.

Habitat. In mixed *Quercus* and *Pinus* forest, secondary low deciduous forest and dry scrub; in low deciduous forest the species tends to be invasive (weedy) and it tolerates acid soils.

Phenology. Flowering and fruiting all year.

Vernacular names and uses. Guapinico, timbre, huajillo, guajillo blanco, chilicap (Chiapas, Mexico). Flores (2001) reported that leaves are used as a livestock forage and the flowers are used for bee forage in the Yucatan Peninsula (Mexico). The bark was traditionally used in the fermentation of 'tepache' and 'pulque' (traditional prehispanic Mexican alcoholic drinks). In Michoacan, Mexico, it has been reported as a medicinal plant. The bark is boiled with water and this infusion is drunk to cure diarrhoea. The root is also prepared in the same way and drunk to cure gastritis. In the past, the roots were used extensively for their tannins; nowadays this species has been replaced by other leguminous species, such as *Caesalpinia cacalaco* [personnal interviews in several Mexican states].

Taxonomic comments. Acacia glabrata Schldl., Linnaea 12: 569 (1838) was placed by several authors in synomymy under *A. angustissima*. The description given by Schlechtendal (1838) ["rhachis cum petiolo glanduloso 4-5 poll. longa."] corresponds to the plant "Ac. Sp. Linn. 692", and careful reading of the text leads us to believe that this is a *Leucaena* species, probably *L. diversifolia*.

In flowering material this variety is easy to recognise; plants are usually glabrous, or if pubescent then sparsely so with appressed hairs; leaflets are glabrous or sometimes with very shortly ciliate margins. The calyx is usually glabrous while that of *Acacia angustissima* var. *filicioides* (see next) is usually hirsutulous pubescent to some degree. When material is in fruit it is easy to recognise because of its long beak, reaching up to 5 mm, straight or curved towards the apex.

Conservarion status. Acaciella angustissima var. *angustissima* is the fastest growing and most widely distributed species of *Acaciella*. It produces a high quantity of seeds and has been noted as being invasive in some areas. A rating of Least Concern (LC) is advised.

Representative specimens

AUSTRALIA. **Queensland**: 18º 47' S, 146º 07' E, 9-V-2000, *Bean, A.R. 16606* (K, NSW); Brisbane: Indooroopilly., Cultivated, 27º 31' S, 152º 59'07'' E, 25-III-1984, *Pedley, L. 4955* (BRI, K, MEXU, MO). BOLIVIA. **Beni:** Serrania del Pilon Lajas. 21 km de Yucumo, 15º 17' S, 67º 04' W, 1035 m, 17-V-1989, *Smith, D.N. 13203* (BOLV, G, LPB, MO, USZ). **Chuquisaca**: 19º 14' S, 64º 12' W, 2780 m, 23-I-1998, *Serrano, Martha 2776* (SCZ); 19º 07'19'' S, 64º 14'50'' W, 2075 m, 24-III-2004, *Wood, J. 20528* (K). **Cochabamba**: Comunidad Hoyadas, 17º 30' S, 65º 00' W, 2350 m, 20-III-1994, *Caballero, P. 91* (K, LPB); between Chujllas and Torota, 17º 56'47'' S, 65º 09'43'' W, 2223 m, 7-II-2003, *Rico, L. 1275* (K, LPB). **La Paz**: Bajo de Pariguaya, 16º 40' S, 67º 31' W, 2000 m, 30-IV-1995, *Beck S. 22423* (K, LPB, USZ). **Santa Cruz**: Portachuelo, Between comunity San Juan and Rio Palometillas, 17º 23' S, 63º 31' W, 295 m, 27-V-1991, *Nee, M. 40604* (G, K, MEXU, NY, USZ). COLOMBIA. **Antioquia**: Medellin-Turbo Rd., Western slope of Cordillera occidental, 6º 51' N, 76º 08' W, 2000 m, 7-X-1977, *Gentry A. 20202* (MO). **Santander**: Barbosa, Motel grounds, 6º 27' N, 75º 20' W, 2-X-1984, *Johnson, C.D. 3499-84* (MO); between Pamplona and La Isla, 2º 52' N, 74º 27' W, 2500 m, 27-II-1927, *Killip, E.P. 19791* (K). COSTA RICA.

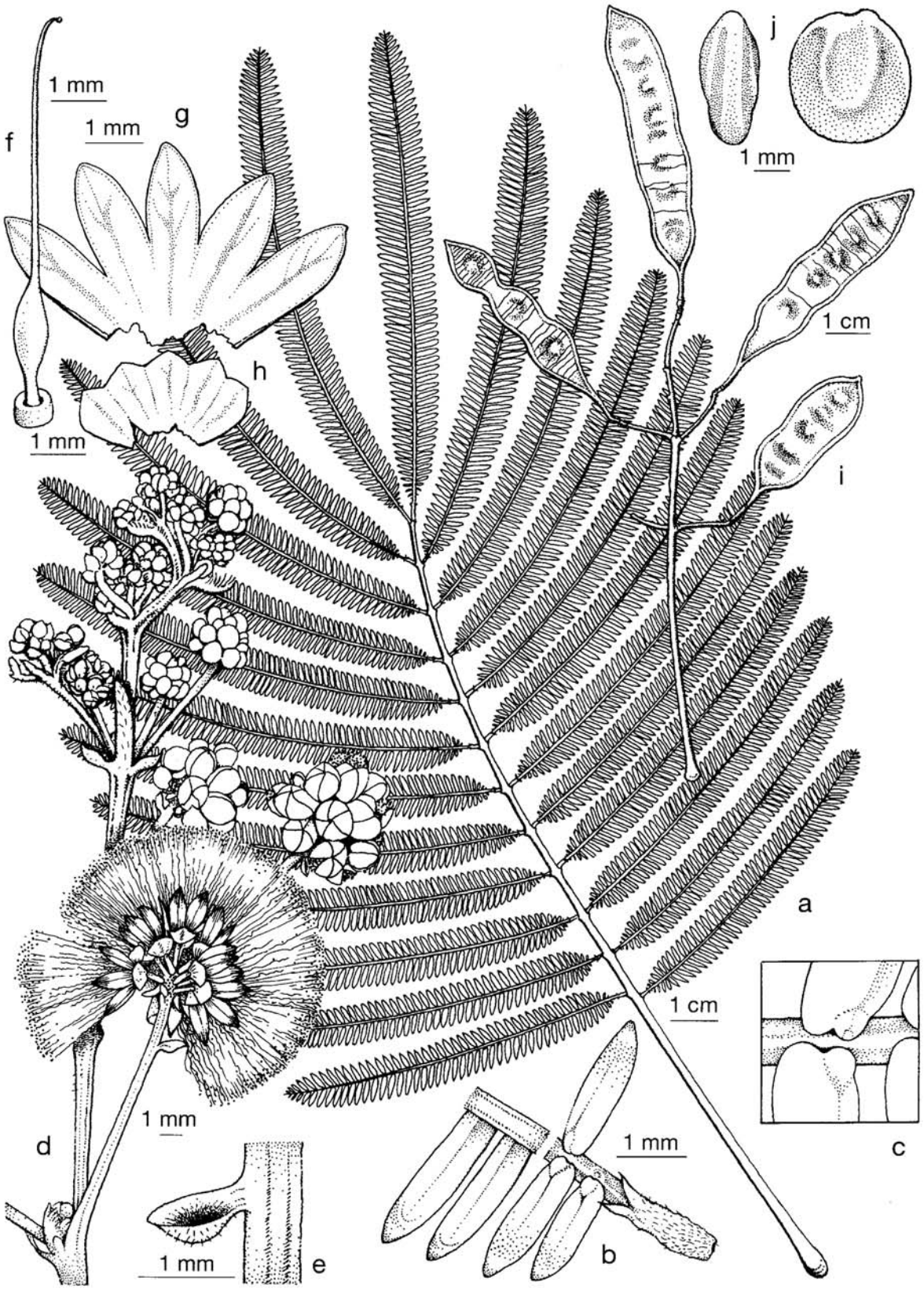

Fig. 2. *Acaciella angustissima* var. *angustissima*: **a,** leaf ; **b,** base of pinna showing paraphyllidia and pubescence, leaflets showing venation, both surfaces; **c,** detail of leaflet insertion; **d,** inflorescence; **e,** peduncular bract; **f,** gynoecium and basal nectary; **g,** corolla, opened out; **h,** calyx, opened out; **i,** infrutescence; **j,** seed two views. a-c, i, j, from *C.E. Hughes 920*; d, e, from *Bourgeau 2570*; f-h, from *Sousa & al. 5920*. Drawn by E. Papadopoulos.

Aserri: Sur les collines Aserri, 9º 52' N, 84º 05' W,-VIII-1889, *Tonduz 1280* (BM). **Buenos Aires**: 9º 22' N, 83º 16' W, 1900 m, 28-IX-1989, *Valerio, M. 125* (CR, K). **Cartago**: Cartago, 9º 50' N, 84º 00' W, 1417 m,-X-1899, *Biolley 8973* (BM). **Río Toves (Covies)**: 28-XI-1889, *Tonduz 1445* (BM, G). **San Francisco de Guadalupe**: 9º 57' N, 84º 03' W, 1170 m,-XII-1893, *Tonduz 1562* (BM, G). **San José**: Zona protectora El Rodeo, entre, 9º 54'40'' N, 84º 17' W, 950 m, 25-XI- 1996, *Cascante, A. 1213* (CR, K); 9º 57' N, 84º 03' W, 880 m,-XII-1935, *Skutch, A.F. 2308* (CR, K). **Santa Bárbara**: entre Barba & Sta. Bárbara, 10º 05' N, 84º 09' W, 21-XII-1889, *Tonduz 1654* (G). DOMINICAN REPUBLIC. **La Vega**: Terracería de la Ciénega de Banabao a Jarabacoa, cerca de Los Limones, 19º 20' N, 70º 30' W, 1000 m, 25-III-2001, *Delgado S., A. 1997* (MEXU). ECUADOR. **Loja**: 4º 22' S, 79º 30' W, 1300 m, 6-VI-1987, *Hughes, C.E. 1019* (FHO, K, MEXU, QAME). EL SALVADOR. **Ahuachapan**: camino a Apaneca, 13º 51' N, 89º 49' W, 1470 m, 20-XI- 1990, *Calderón M. 618* (K, LAGU); El Corozo, mariposario (zona b), 13º 49' N, 89º 59' W, 200 m, 7-IX-2000, *Rosales, J.M. 1373* (B, LAGU, MO). **Chalatenango**: Las Pilas, calle al Pital cerca del río Sumpul, 14º 20' N, 89º 11' W, 2000 m, 2-XI-1996, *Berendsohn, W. 1625* (B, K, LAGU). **La Libertad**: 13º 50' N, 89º 30' W, 200 m, *Beetle 8840* (K). **Morazán**: (N slope), 13º 46' N, 88º 13' W, 1515 m, 30-XII-1941, *Tucker 682* (G)**. Santa Ana**: 13 km to the south of Santa Ana on the north facing slopes of Cerro Verde, 13º 55' N, 89º 49' W, 1160 m, 21-I-1993, *Macqueen, D.J. 499* (FHO, K, LAGU, MEXU, NY). GUATEMALA. **Chiquimula**: 14º 48' N, 90º 56' W, 1120 m, 13-X-1985, *Hughes, C.E. 718* (FHO, K, MEXU). **Guatemala**: 14º 35' N, 90º 30' W, 1620 m, 3-III-1988, *Hughes, C.E. 1109* (FHO, K, MEXU). **Huehuetenango**: 3 km N of Chiantla, 15º 22' N, 91º 27' W, 26-XI- 1962, *Williams, L.O. 21714* (G); Aguacatan, 15º 21' N, 91º 18' W, 28-XI-1962, *Williams, L.O. 21871* (G); **Peten**: Santa Elena, 16º 47' N, 90º 07' W, 27-IX-1971, *Tun Ortiz, R. 1943* (BM). **Quezaltenango**: 14º 40' N, 91º 30' W, 2830 m, 24-VII-1934, *Skutch, A.F. 824* (BM). **San Marcos**: San Marcos, 14º 55' N, 91º 45' W, 2140 m, 3-III-1992, *Hughes, C.E. 1700* (E, FHO, K, MEXU, MO, NY). **Santa Rosa**: 14º 10' N, 90º 18' W, 1000 m,-VIII-1892, *Heyde 3739* (G, M). **Zacatepequez**: 14º 38' N, 90º 41' W, 2160 m, 1891, *Gómez, Rosalio 1045* (G). HONDURAS. **Catacamas**: Catacamas, 1 km al N, 14º 54' N, 85º 56' W, 8-XI-1987, *López, Orlando 64* (BM). **Choluteca**:

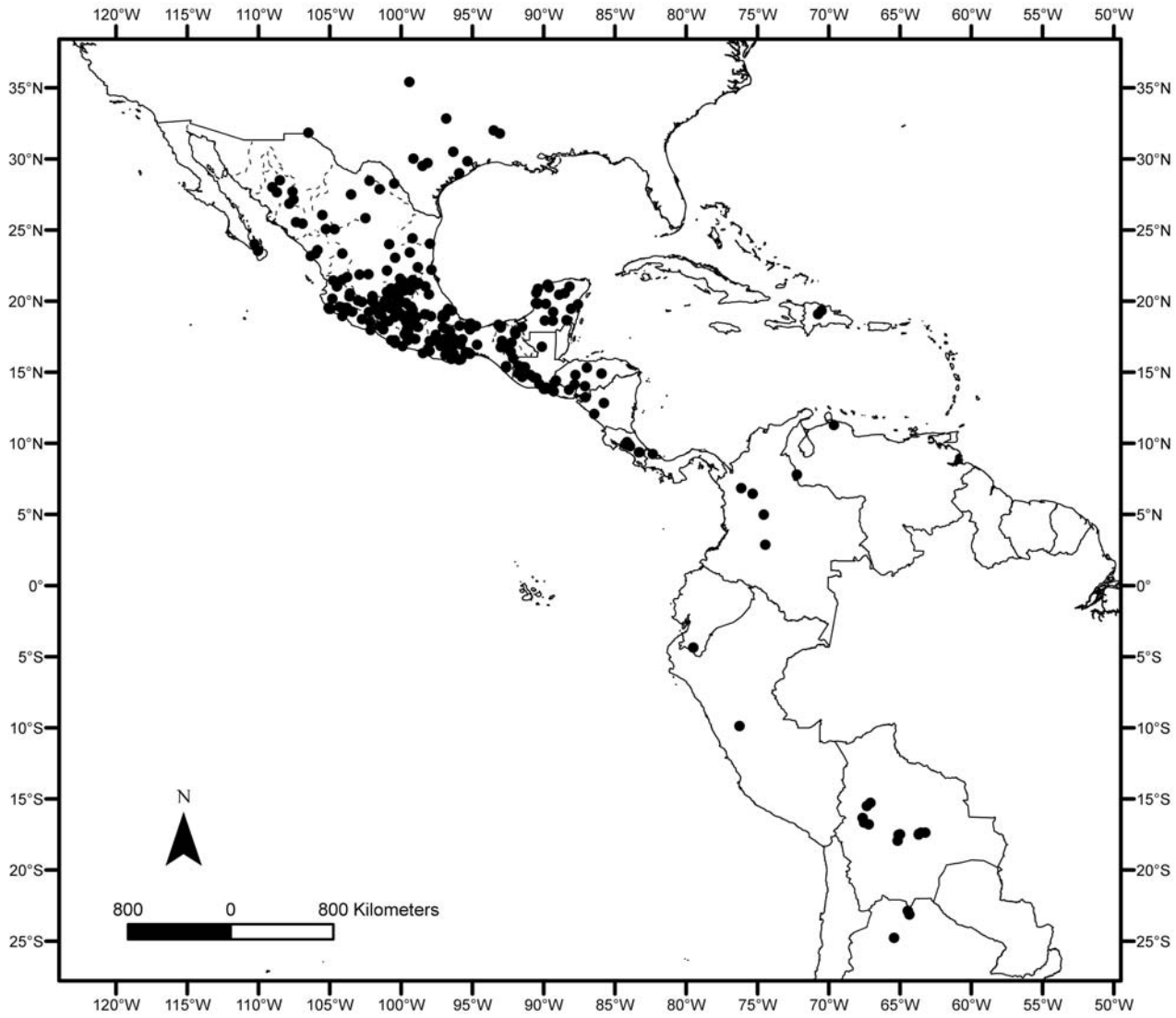

Fig. 3. Geographical range of *Acaciella angustissima* var. *angustissima*.

13º 14' N, 87º 04' W, 850 m, 13-X-1988, *Hughes, C.E. 1209* (EAP, FHO). **Comayagua**: Meambar, 14º 48' N, 87º 46' W, 550 m, 9-I-1991, *Hughes, C.E. 1372* (EAP, FHO, K, MEXU, NY). **Morazán**: La Montañita, 14º 25' N, 89º 08' W, 1500 m, 18-XI- 1948, *Molina, A. 1611* (BM). **Yoro**: Macora, 15º 19' N, 86º 58' W, 440 m, 17-II-1991, *Hellin J.J. 12* (EAP, FHO, K, MEXU, NY). MEXICO. **Aguascalientes**: Aguascalientes, 21º 53' N, 102º 17' W, 1836, *Hernández M., R. 1601* (K). **Baja California**: La Paz, 24º 01' N, 110º 17' W, 180 m, 19-I-1992, *Hughes, C.E. 1535* (FCME, FHO, K, MEXU, NY). **Campeche**: km 16 carretera Campeche-Pomuch, entronque con Hampolol, 19º 50' N, 90º 25' W, 4 m, 12-X-1984, *Chan, C. 4213* (CICY, K, MEXU). **Chiapas**: Comitan de Domínguez, 16º 26' N, 92º 18' W, 2190 m, 8-VIII-1991, *Hughes, C.E. 1487* (FHO, K, MEXU, MO, NY). **Chihuahua**: Batopillas, Rio Mayo, 26º 51' N, 107º 50' W, 8-IX-1936, *Gentry H.S. 2610* (K, MEXU, US); Ceracahui, S of Creel, 27º 42' N, 107º 37' W, 13-VII-1958, *Knobloch, I.W. 861* (BM). **Coahuila**: Rancho Agua Dulce; Lower slopes of the Sierra de San Manuel, 27-VI-1936, *Lyle Wynd, F. 312* (K, MEXU). **Colima**: Canoa Verde, 18º 57' N, 104º 07' W, 2550 m, 12-X-1952, *McVaugh 13449* (G). **Distrito Federal**: Cerro Chiquihuite, August, *Boop, M. 128* (MEXU); mercado de Sonora, zona externa, esquina SW, en frente del mercado del canal, 7-VI-1998, *Bye, R. 26014* (MEXU). **Durango**: reserva de la biosfera La Michilia, cerro Las Iglesias; Sierra de Urica, 8 km al E de El Alemán, 23º 20'40'' N, 104º 07'05'' W, 2400 m, 25-X-1986, *Acevedo, F. 355* (CIIDIR, K); alrededores de balneario La Joya; Mezquital, 26º 03' N, 105º 31' W, 19-I-1983, *González Medrano 1148* (MEXU). **Guanajuato**: 20 km al N-NW de Juventino Rosas, Mpio. de Juventino Rosas, 20º 39' N, 101º 00' W, 2200 m, 4-VII-1992, *Galván, R. 3923* (IEB). **Guerrero**: 3 km SW de Ixcateopán, 1050 m, 11-VIII-1990, *Calzada, J.I. 15701* (MEXU); 4 km al NW de Chaucingo, ca. Quetzalapa, 18º 18' N, 99º 12' W, 850 m, 28-VI-1981, *Luna Anaya 78* (FCME). **Hidalgo**: Huautla, La Candelaria, 21º 02' N, 98º 17' W, 270 m, 5-XI- 1983, *Espinosa, G.J. 354* (MEXU); border Hidalgo, San Luis Potosi, km 343-344 on Hwy below Chapulhuacan, 21º 10' N, 98º 54' W, 700 m, 22-IX-1949, *Moore, H.E. 5044* (BM). **Jalisco**: Chamela Bay, Rancho El Porvenir frente a la Estación de Biología de Chamela, 19º 32' N, 105º 05' W, 30 m, 14-II-1990, *Calzada, J.I. 15168* (K); 2-3 km al S-SE de La Laguna, 19º 31' N, 103º 58' W, 1900 m, 11-II-1988, *Cuevas, R. 2198* (MEXU). **México**: Tenancingo, 18º 58' N, 99º 36' W, X-1827, *DC-Prodromus 1191, 812* (G); 8-9 km al S de Nanchititla en el camino a Bejucos, 18º 52' N, 100º 28' W, 19-XI-1993, *González Medrano 6452* (K, MEXU). **Michoacán**: Chupicuaro, 20º 01' N, 101º 09' W, 2100 m, 5-XII-1985, *Díaz B., H. 1825* (IEB); Cerro Grande, Mpio. La Piedad, 20º 21' N, 102º 00' W, 2500 m, 27-VIII-1986, *Labat, J.N. 1881* (IEB). **Morelos**: km 54.5 en la autopista DF-Cuernavaca, 19º 05' N, 99º 15' W, 2300 m, XI-1959, *Espinosa, G.J. 244* (MEXU); Huitzilae, 1930, *Lyonnet 643* (BM, K, MEXU); Morelos, 44 km S of Cuernavaca, 18º 44' N, 99º 15' W, 16-VII-1993, *Seigler, D.S. 13902* (MEXU). **Nayarit**: 12 km entronque carr. Tepic-Ixt, 12 km del entronque carr. Tepic-Ixtlán, 21º 27' N, 104º 45' W, 1340 m, 11-XI- 1993, *Flores F., G. 3259* (FCME). **Nuevo León**: Just E of border into Tamaulipas, 24º 00' N, 100º 50' W, 2-VII-1948, *Meyer, F.G. 2730* (G). **Oaxaca**: San Miguel Yotao, 7,6 km al NW de Tanetze, camino a Cacalote, puente sobre río Juquila, 17º 22' N, 96º 19' W, 790 m, 3-X-1995, *Acosta, S. 2678* (MEXU); San Felipe, 17º 53' N, 96º 33' W, VII-1834, *Andrieux, G. 398* (G, K, MEXU, OXF). **Puebla**: 2175 m, 16-VII-1907, *Arsène 1979* (MEXU); Santa Mónica, 18º 11' N, 98º 48' W, 7-XI- 1980, *Lugo, A.A. 23* (MEXU); 8-VI-1909, *Nicolás Hno. s.n.* (G). **Queretaro**: Amealco, 20º 11' N, 100º 09' W, 2100 m, 4-VII-1971, *Argüelles, E. 1629* (MEXU); Santa María de Cocos, 10 km de Puerto de Ayutla, camino a Santa María de Cocos, 21º 00' N, 100º 10' W, 1400 m, 27-VII-1989, *Carranza, E. 1893* (IEB). **Quintana Roo**: Quintana Roo, Felipe Carrillo Puerto, Humay 9,5 km hacia Felipe Carrillo Puerto, 19º 28' N, 88º 04' W, 16 m, 19-X-1985, *Balam, F. 510* (CICY, K); Ucum, 19º 14' N, 89º 20' W, 100 m, 10-X-1997, *Martínez Esteban 28621* (MEXU). **San Luis Potosí**: San Luis Potosí, 22º 09' N, 100º 59' W,-VI-1886, *Palmer, E. 647* (G); a 21 km al E de Tamazunchale (Loma de Aguayo), 21º 16' N, 98º 47' W, 900 m, 13-II-1982, *Tenorio, P. 56* (K, MEXU). **Sinaloa:** 5 km al SW de Santiago de los Caballeros, 25º 33' N, 107º 22' W, 1200 m, 11-XII-1982, *Aguilar , J.M. 172* (MEXU); 7.5 m SW of El Palmito, 8.2 mi. SW of Durango-Sinaloa St. line across hwy 40, 23º 35' N, 105º 52' W, 2000 m, 6-I-1983, *Worthington, R.D. 9317* (TEX). **Sonora**: Río Mayo, 28-VIII-1935, *Gentry H.S. 1638* (K, MEXU); Sierra Charuco, Sonora, 9-IX-1935, *Gentry H.S. 1701* (K, MEXU). **Tabasco**: en el km 11,6 de la villa Teco, Tupilco, 8-II-1982, *Magana, M.A. 671* (MEXU); Nacajuca, Puente Tumuluchal, a 4 km al, S de Playas del Rosario a sea, a 21 km al S de Villahermosa, 18º 20' N, 93º 10' W, 60 m, 5-III-1981, *Sousa, M. 11715* (BM, K, MEXU). **Tamaulipas**: Tantoyuca, 24º 25' N, 99º 12' W,-VI-1858, *Ervendberg s.n.* (G); Verde Grande, 24º 02' N, 97º 58' W, 2000 m, 22-VI-1949, *Standford 2024* (G); Jaumave, 23º 25' N, 99º 23' W,-VII-1932, *VonRozynski H.W. 526* (G). **Veracruz**: Zacuapán, Arroyo, 18º 12' N, 95º 16' W, IX-1906, *Purpus 1878* (BM); Veracruz-Llave, 19º 20' N, 96º 40' W, 1857, *Sumicharst 1772* (G, K); Los Jovos 3 km S of La Balsa, 19º 21' N, 96º 38' W, 360 m, 17-II-1982, *Vázquez, B. 466* (XAL). **Yucatán**: Mérida, frente al CICY, 20º 58' N, 89º 37' W, 26-IX-1983, *Acosta, C. 10* (MEXU); camino a Xcopteil, 18º 38' N, 89º 55' W, 20 m, 14-VIII-1984, *Chan, C. 3849* (K, XAL); 4.5 km S of Celestun, Junction on road S to Chunchucmil, 20º 52' N, 90º 24' W, 7 m, 19-II-1996, *Way, M.J. 151* (K, MEXU). **Zacatecas**: 7 km adelante de García de la Cadena, Mpio. de García de la Cadena, 21º 52' N, 102º 55' W, 970 m, 15-II-1992, *Reynoso, J.J. 561* (IBUG, K). NICARAGUA. **Managua**: Carr. Panamericana; km 18, 12º 04' N, 86º 27' W, 200 m, 7-IX-1983, *Araquistain, M. 3621* (BM). **Matagalpa**: San Ramón, 12º 50' N, 85º 46' W, 850 m, 15-I-1991, *Hughes, C.E. 1373* (EAP, FHO, K, MEXU, NY); PANAMA. **Bocas del Toro**: 9º 15' N, 82º 20' W, *Seemann 10* (K). PERU. **Huanuco**: Road to Monzon about 1,5 km east of Puente Rondos, 29-VI-1959, *Mathias, M.E. 3494* (K). USA. **Arizona**: Santa Cruz Valley, *Pringle 1881* (US); The Research Ranch (Ranch Santa Ana), 61 mi SSE of Tucson, 1600 m, 3-IX-1988, *Elias, T.S. 12196* (K, MEXU). **Arkansas**: 32º 00' N, 93º 30' W, *Torrey, J. s.n.* (K). **Kentucky**: 37º 20' N, 85º 00' W, *Short, C.W s.n.* (K). **Louisiana**: Natchitoches, 31º 47' N, 93º 04' W, 6-V-1915, *Palmer, E. 7560* (K). **New Mexico**: 31º 50' N, 106º 30' W, X-1849, *Wright, C. 131* (K). **Oklahoma**: City Prairies, 23-VII-1929, *Clarke, O.M. 2233* (G); City Prairies, 3-IX-1929, *Clarke, O.M. 2302* (G). **Texas**: Valle of Río Grande, Doña Ana, 22º 22'46'' N, 98º 49'12'' W, *Emory,W.H. 326* (K); 29º 50' N, 95º 20' W, 15-VI-1872, *Hall, E. 177* (G, K); Kerrville, 30º 01' N, 99º 08' W, 650 m, 21-V-1894, *Heller, A. 1770* (K). VENEZUELA. **Falcón**: km 16 Coro-Curimagua, 11º 17' N, 69º 38' W, 1000 m, 22-III-1993, *CIAT 18284* (K). **Tachira**: 7º 48' N, 72º 14' W, 1000 m, 26-I-1985, *Johnson, C.D. 3782-85* (MO). **Unknown**: 1856, *Berlandier 2510* (G, K);-IV-1839, *Hartweg s.n.* (G); 1833, *Mairet, M. s.n.* (G); 18-VIII-1886, *Schumann, W. 207* (M).

1b. Acaciella angustissima var. **filicioides** (Cav.) L. Rico, Kew Bull. 59(2): 327. 2004.

Mimosa filicioides Cav., Ic. 1: 55 tab. 78 (1791). *Acacia filicioides* (Cav.) Trel., Annual Rep. Geol. Surv. Ar-

kansas 1888 (4): 178. 1891. *Acaciella filicioides* (Cav.) Britton & Rose, N. Amer. Fl. 23: 100. 1928.
Type: Mexico: "*Vidi floridam in dicto horto mense Octobri*" (lectotype, designated here, MA 259538!).
Acacia filicina Willd. Sp. Pl. 4: 1072. 1806.
Type: Mexico: "ex Horto Patarino 1804" (lectotype designated here, B-Willd,; photograph of lectotype MEXU! ex B., microfiche IDC.7440.1389 I-5, K!).
Acacia hirsuta Schldl., Linnaea 12: 572. 1838. *Acaciella hirsuta* (Schldl.) Britton & Rose, N. Amer. Fl. 23: 99. 1928. *Senegalia hirsuta* (Schldl.) Pittier, Man. Pl. Usual. Venez. (Suppl.): 36. 1939.
Type: Mexico: Veracruz, Tiocelo [Teocelo], *Shiede & Deppé s.n.* (lectotype, designated here, HAL; isolectotypes, G!, US! [fragment], OXF!).
Acacia stipellata Schltdl. Linnaea 12: 574. 1838.

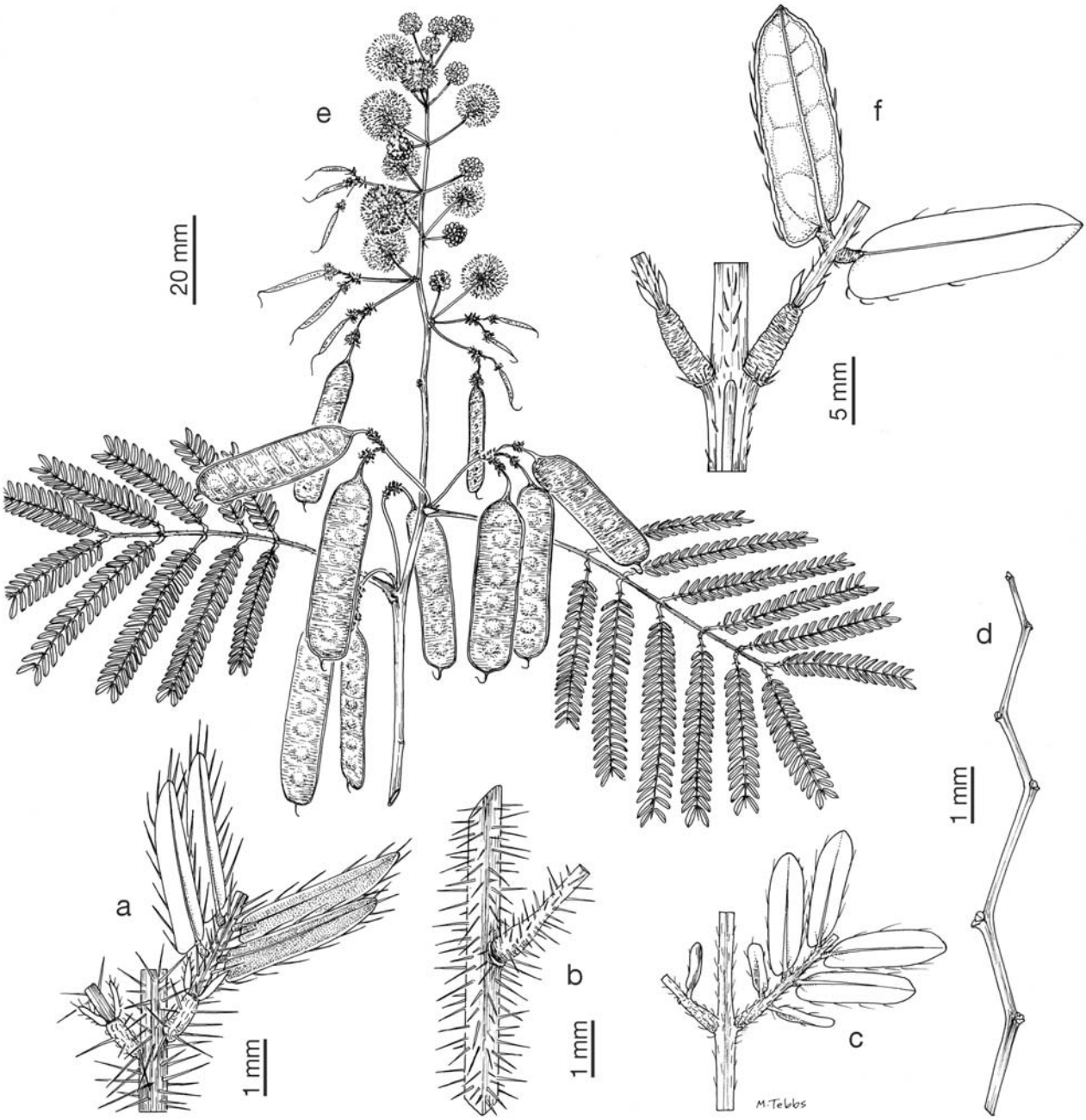

Fig. 4. *Acaciella angustissima* var. *filicioides*: **a,** leaf fragment showing paraphyllidia on pinnae bases, a very dense hispid pilose-pubescence, leaflets (both surfaces) with ciliate margins; **b,** twig fragment showing stipule scar and petiole base. *Acaciella angustissima* var. *texensis*: **c,** leaf fragment showing showing paraphyllidia-like structures on pinnae bases (as unqual small leaflets), leaflet undersurfaces with ciliate margins; **d,** zig-zagged glabrous twig showing leaf buds. *A. glauca*: **e,** habit with inflorescence and infrutescence; **f,** leaf fragment showing channelled rachis and paraphyllidia on pinnae bases, very sparce pubescence, leaflets (both surfaces) and thickened margin as shown on lower surface. a-b, from *Tenorio & al. 9659;* c-d, from *Nelson 4712;* e-f, from *Cooley 8152*. Drawn by M. Tebbs.

Type: Mexico: [near Mexico City], *Mühlenpfordt s.n.* (holotype, HAL; isotype, US! [fragment], photograph of type K!).

Senegalia popayana Britton & Killip, Ann. New York Acad. Sc. 35: 143. 1936.

Type: Colombia: Popayán, El Cauca, 17-IV-1876, *André 2773* (holotype, NY!; isotype, K!).

Acaciella holtonii Britton & Killip, Ann. New York Aca. Sci. 140. 1936.

Type: Colombia: El Valle, La Paila, 30 May, 1853, *I. Holton 998* (holotype, NY!; isotype, K!).

Acaciella martensis Britton & Killip, Ann. New York Acad. Sci. 35(3): 140. 1936.

Type: Colombia; "Onaca, Santa Marta, Magdalena, 7 Feb. 1899, *H.H. Smith 295a* (holotype, NY!; isotypes BM!, G!, K!).

Small *tree* up to 5(10) m tall, usually yellow-hirsute throughout, becoming glabrous with age. *Leaves* 7-15 cm long, with 18-32 pairs of pinnae; pinnae 3-4.5 cm long, with paraphyllidia to 0.75 mm long. *Racemes* axillary and terminal, on a main axis, 13-16 cm long, yellow or whitish hirsute, peduncles without pearl glands. *Calyx* 0.6-1 mm long. *Corolla* 2-3 mm long. *Legume* 4.8-6 × 1.4 × 0.3 cm, plus a beak up to 4 mm long, sometimes curved. Fig. 4 a, b.

Distribution. Found naturally from the United States of America, south through Mexico and Central America to Colombia,Venzuela and Bolivia. It has not been recorded from Ecuador, Peru, Argentina, and other South American countries as a native variety. Fig. 5.

Habitat. Mainly in *Pinus-Quercus* forest, less often in seasonally dry forest and transitional vegetation be-

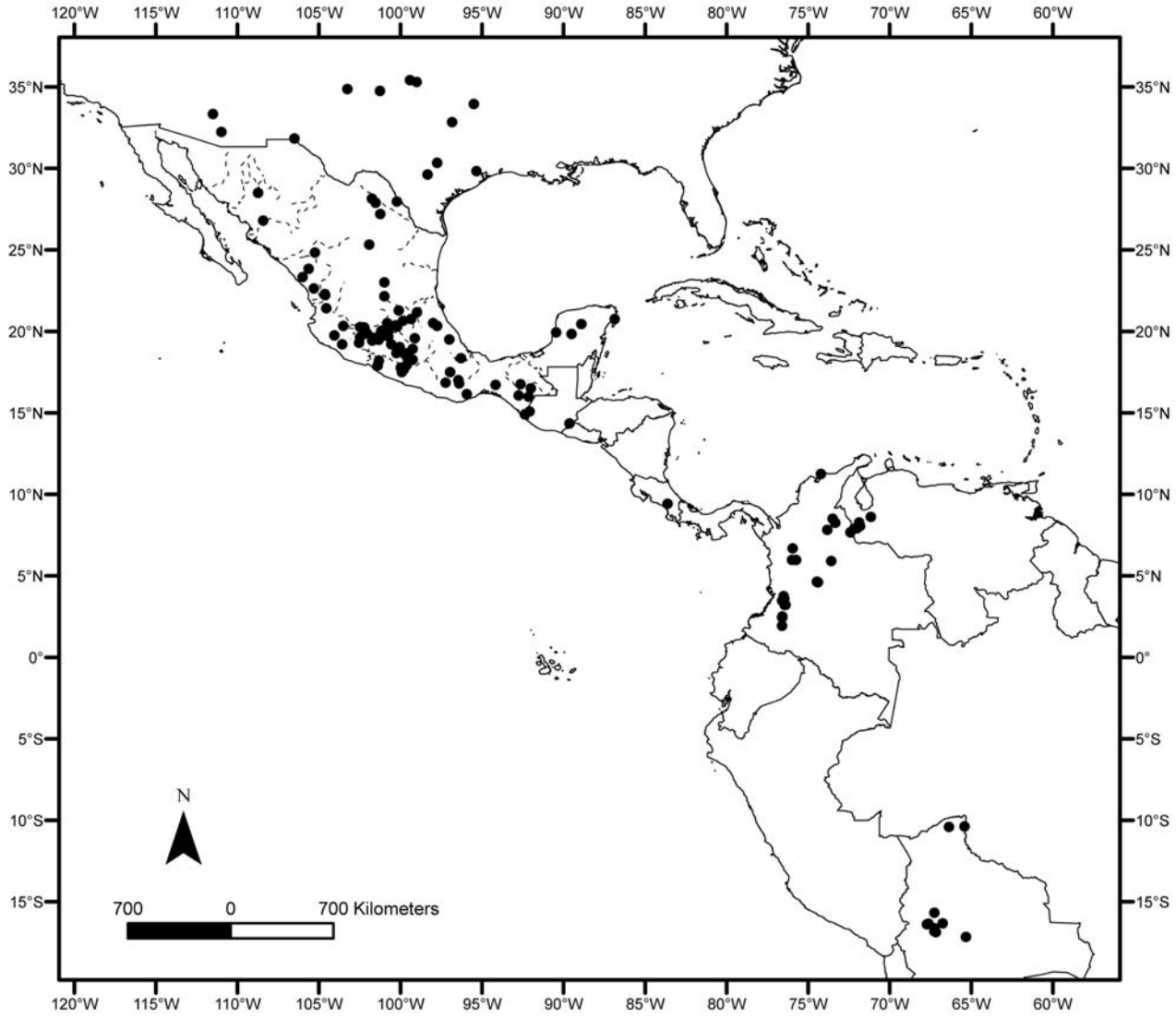

Fig. 5. Geographical range of *Acacia angustissima* var. *filicioides*.

tween the two; also in dry scrub; a few reports in *Pinus-Juniperus* forest, grassland, occasionally in secondary succession of humid rain forest; paramo (Venezuela); prefers black or red acid soils. Alt. (250)800-2200(2600) m.

Phenology. Flowering and fruiting all year.

Vernacular names and uses. Chilicap, timbre. Leaves are used as forage (livestock, including turkeys), roots used for tanning, and the bark is chewed to strenghten gums; an infusion of leaves is reported to cure diarrohea.

Taxonomic comments. The variety has been recorded as a 10 m tall tree in the Yungas, Bolivia (*Beck* 363), which is the maximun height of this variety; trees are usually below 5 m tall. The lowest altitude records are from Yucatan (22 m, *Ucan* 1515) and Oaxaca (40 m, *Sarukhan* & *Pennington* 163), Mexico; in contrast, two reports from herbarium labels were for 2,600 m alt., although verifying these with a gazetter, the altitude of the two localities were found to be less than 2,000 m. This is an attractive variety compared with the other two (*A. angustissima* var. *texensis* and *A. angustissima* var. *angustissima*) because of its feather-like leaves and velvety branches.

Conservarion status. Acaciella angustissima var. *filicioides* is a frequently encountered taxon and is widely distributed in scattered populations from the United States in Arizona, California, Oklahoma and Texas through Mexico, Central America and then to Bolivia. A rating of Least Concern (LC) is given.

Representative specimens

BOLIVIA. **Beni**: N de Yungas, Caranavi hacia Alto Beni, 10º 23' S, 65º 24' W, 1650 m, 21-VIII-1986, *Beck S. 12703* (K, LPB, MO). **La Paz**: S Yungas, entre Chulumani & Iruapana, 17º 10' S, 65º 19' W, 1900 m, 7-III-1979, *Beck S. 363* (LPB); N Yungas, arriba de Puente Villa, Tarila Alto, 16º 20' S, 66º 45' W, 1700 m, 8-III-1979, *Beck S. 417* (LPB); 3 km hacia Circuata, 16º 38' S, 67º 15' W, 2200 m, 20-II-1981, *Beck S. 4491* (LPB, NY); Basin of Rio Bopi, San Bartolome, near Calisaya), 15º 41' S, 67º 15' W, 800 m, 22-VII-1939, *Krukoff 10383* (MO). **Santa Cruz**: 10º 25' S, 66º 22' W, 1835, *Orbigny, A. 997* (G). COLOMBIA. Calle, 6-9 km NW of Yumbo, 3º 35' N, 76º 28' W, 17-VII-1982, *Johnson, C.D. 2455-82* (MO). **Antioquia**: 10-17 km S of Canas Gordas, 6º 41' N, 75º 57' W, 2000 m, 27-II-1992, *Gentry A. 75717* (MO); 4º 36' N, 74º 24' W, *Jenvise s.n.* (K); Finca Media Luna, 5º 58' N, 75º 44' W, 1335 m, 24-XI- 1991, *Sánchez, D 1655* (MO). **Bogotá**: 4º 38' N, 74º 28' W, I-1853, *Triana, J. 6834 [4448]* (BM). **Boyacá**: 1 km NW Moniquira camino a Barbasa, 5º 54' N, 73º 35' W, 1630 m, 11-II-1996, *Belalcázar, J. 20126* (K). Grenade, 8º 30' N, 73º 30' W, 1200 m, -X-1856, *Linden, J. 172* (BR, K). **Magdalena:** Santa Marta, hoya del río Dona, 1º 56' N, 76º 36' W, 1400 m, 22-IX-1959, *Cuatrecasas, J. 24323* (K); New Granada**,** Neogranadina-Caucana, 3º 13' N, 76º 26' W, 24-V-1853, *Holton, I. 997* (G, K, US); Ocaña to Pamplona, 8º 15' N, 73º 20' W, 2500 m, 30-VIII-1875, *Kalbreyer, W. 755* (K); 8º 30' N, 73º 30' W, 1300 m, X-1850, *Schlim 172* (BM). **Popayán**: 2º 27' N, 76º 35' W, 2000 m, *Lehmann 373* (G); 2º 27' N, 76º 36' W, 1700 m, 1-II-1906, *Lehmann 5369* (K). **Salgar**: entre vereda Puente Arturo y La Taborda, 5º 58' N, 75º 59' W, 1190 m, 21-XI-1989, *Girón, V.M. 235* (K). **Valle del Cauca**: Palmira (lote Exp.), Palmira, Valle, 15 km NO, 3º 28' N, 76º 36' W, 1500 m, 21-IV-1994, *Belalcazar, J. 7451* (K); 3º 45' N, 76º 30' W, IV-1853, *Triana, J. 6834bis[4449]* (K); [Bucaramanga], 7º 49' N, 73º 49' W, 950 m, 23-X-1977, *Rentería, E. 794(6)* (MO). COSTA RICA. **San José**: on the road from Rivas to Cannan to the north east of San Isidro del General in the department of San Jose, 9º 25' N, 83º 37' W, 1400 m, 4-IV-1991, *Macqueen, D.J. 102* (EAP, FHO, K, MEXU, MO). GUATEMALA. San Miguelito, 14º 21' N, 89º 38' W, 1866, *Bernoulli 1138* (K). MEXICO. **Campeche**: Campeche, 19º 51' N, 90º 32' W, 31-I-1978, *Forero, Luis E. 1224* (CIAT, K). **Chiapas**: Talquian, 15º 05' N, 92º 05' W, 1350 m, 8-XI-1977, *Calzada, J.I. 3734* (XAL); Puente Monte Perla, 1 mi N, between Tapachula and La Unión, 14º 54' N, 92º 22' W, 1100 m, 10-II-1979, *Croat, T. 47190* (MEXU); cerro San Felipe, al S de San Cristóbal de las Casas, 16º 04' N, 92º 45' W, 10-XI- 1985, *Galván, R. 8539* (K, MEXU); Chiapas, Sierra de, 16º 30' N, 92º 00' W, 1864, *Ghiesbreght 592* (BM, G). **Chihuahua**: 4 km al S de Kirare, camino a la Bufa, 25-IX-1985, *Tenorio, P. 9943* (MEXU). **Coahuila**: 5 miles north-west of Hacienda Mariposa, 28º 09' N, 101º 45' W, 26-VI-1936, *Lyle Wynd, F. 287* (K, MEXU); Rancho Agua Dulce; Lower slopes of the Sierra de San Manuel, 27º 58' N, 100º 13' W, 27-VI-1936, *Lyle Wynd, F. 314* (K, MEXU). **Durango**: Mesa de San Francisco, El Salt, Mesa de San Francisco a 24 km al SE de El Salto, 24º 50' N, 105º 15' W, 2430 m, 10-IX-1983, *Tenorio, P. 4324* (BM, MEXU); La Mole, al NE de la Libertad, 23º 50' N, 105º 38' W, 1900 m, 4-VII-1984, *Tenorio, P. 6201* (BM); La Mole, 1800 m, 11-IX-1985, *Tenorio, P. 9659* (K, MEXU). **Guanajuato**: San Nicolás del Palenque, 20º 30' N, 100º 49' W, 1930 m, 9-IX-1991, *Galván, R. 3754* (IEB); La Sabila, 1740 m, 30-IX-1987, *Ibarra, S. 366* (IEB); 7 km al N de San Luis de los Agustinos, 20º 01'60'' N, 100º 43'60'' W, 2600 m, 16-VII-1986, *Rubio, A. 298* (IEB, XAL). **Guerrero**: Puerto Obscuro, 15 km de la desviación, 18º 36' N, 99º 42' W, 2300 m, 28-XI-1997, *Calonico S., J. 6344* (MEXU); a 4 km de Carrizalillo, hacia Mezcala, cañón de Zopilote, 17º 56' N, 99º 37' W, 1380 m, 3-IX-1983, *Campos, G. 681* (MEXU); puerto de Caballo, a 3 km al SW de Filo de Caballo a puerto del Caballo, 2410 m, 3-VI-1983, *Martínez Esteban 3903* (XAL). **Hidalgo**: Zimapán, 20º 45' N, 99º 21' W, *Coulter 514* (K, MEXU); El Saltito, 3 km N of Pisaflores, 21º 10' N, 98º 59' W, 250 m, 27-X-1982, *Tenorio, P. 2434* (MEXU). **Jalisco**: 5-6 km al W de San Buenaventura entre San Buenaventura y El Agua Dulce, 19º 45'02'' N, 104º 03'07'' W, 950 m, 2-X-1996, *González Ortega, J. 8325* (MEXU). **México**: 7 km al W de Ixtapam del Oro, brecha Ixtapán del Oro-Los Hoyos, 6-V-1988, *Flores F.,G. 774* (MEXU); Temascaltepec, Carboneras, 19º 02' N, 100º 03' W, 2030 m, 27-VI-1932, *Hinton, G.B. 892* (K); 12 km al W de Amatepec, ca. Cerro del Campo, 18º 40' N, 100º 15' W, 29-I-1992, *Rico, L. 866* (K, MEXU). **Michoacán**: Morelia, 19º 43' N, 101º 11' W, 2000 m, X-1910, *Arsène 64* (G); Oponguio, Quiroga, 19º 36' N, 101º 42' W, 28-VII-1992, *Díaz B., H. 7219* (IEB). **Morelos**: 7,4 km al NE de Tepozotlán, carr. de cuota México-Cuernavaca, 15-XI- 1986, *Cabrera, E. 12298* (MEXU); Sierra de Morelos, 2000 m, 2-VIII-1969, *Hinton, G.B. 17233* (K, XAL). **Nayarit**: 1 km al NE del poblado del Cangrejo, en Cañada, 22º 17' N, 104º 38' W, 1400 m, 14-XI- 1990, *Flores F., G. 2461* (MEXU); 5 km al SE de la Mesa del Nayar, camino a cerro Cangrejo, 22º 13' N, 104º 37' W, 1200 m, 4-IX-1991, *Flores F., G. 2617* (MEXU, MO); Huajicori, río del Talladero, 22º 38' N, 105º 19' W, 19-XI-1885, *Solís, I. 656* (CIIDIR, K). **Oaxaca**: carretera Cuicatlán a

Oaxaca, 1 km al NE de Plan Seco y a 17 km al NE de la desviación a las Sedas, 17º 30' N, 96º 57' W, 2600 m, 25-V-1983, *Cedillo, R. 2315* (MEXU). **Puebla**: Teocalli, apres Puebla, 17-XI-1908, *Arsène s.n.* (K, MEXU); Cerro Azul, 20º 20' N, 97º 45' W, 9-X-1902, *Arsène 73* (G); María Andrea, 2 km al SW, 20º 30' N, 97º 60' W, 16-V-1979, *Basurto, P. 290* (BM, MEXU). **Querétaro**: El Batán, camino a Amealco, donde la presa, 20º 17' N, 100º 12' W, 2045 m, 20-IV-1980, *Argüelles, E. 1368* (MEXU); camino entre Huimilpán-Qro. y carr. Los Cues, km 6, 20º 22' N, 100º 17' W, 2020 m, 29-VI-1986, *Argüelles, E. 2540* (IEB, MEXU). **Quintana Roo**: 1 km al N de la desviación a Puerto Morelos, sobre la carretera Cancún-Tulum, 20º 45' N, 86º 52' W, 22-IV-1986, *Cabrera, E. 11364* (MEXU); Sian Kan, km 6 carr. Felipe Carrillo Puerto, 25 m, 12-X-1986, *Villanueva Rogel 843* (CICRO). **San Luis Potosí**: San Luis Potosí, 23º 00' N, 100º 59' W, 1875, *Schaffner s.n.[1798]* (M); San Luis Potosí, 22º 09' N, 100º 59' W, 1879, *Schaffner 599 (624)* (M). **Sinaloa**: dentro de la Puerta Ejidal Los Gatos, en Agua Caliente de Zevada, 26º 48' N, 108º 25' W, 12-X-1976, *Pérez, Silverio 67* (MEXU); El Carrizo, a 74 km de concordia por carr. Mzz-Dgo, 23º 20' N, 106º 00' W, 2050 m, 7-VIII-1985, *Vega, A.R. 1656* (MEXU). **Sonora**: 5 km al N de Benjamin Hill, 750 m, 7-VIII-1989, *Grether, R. 2456* (MEXU); Talayote, Arroyo, 12 km al W de Talayote, camino a Yecora o 27 km al E de Yecora. Límites Sonora-Chihuahua, 28º 30' N, 108º 44' W, 27-IX-1983, *Torres, R. 3842* (BM). **Veracruz**: Guetiérrez Zamora, a 5 km de Gutiérrez Zamora, 16-XI- 1981, *Cortez-Vázquez 96* (MEXU); Vista Hermosa, 18º 21' N, 96º 17' W, 10 m, 28-XI- 1966, *Martínez Calderón, G. 1186* (BM). **Yucatán**: a 35 km al SW de Tzucacab, sobre el camino a Becanchén, 19º 50' N, 89º 30' W, 20-IV-1986, *Cabrera, E. 11329* (BM); *Gaumer, G.F. 24296* (BM); 1919, *Gaumer, G.F. 24307* (BM, K, MEXU, MO); 6 km al W de Tixcacaltuyub, 20º 27' N, 88º 54' W, 22 m, 29-IX-1981, *Ucan, E. 1515* (CICRO). NICARAGUA. **Matagalpa**: 700 m, 4-XII-1962, *Williams, L.O. 22397* (G). USA. **Arizona**: Sta Teresa Mts., Jackson Mt., NW S of Glover's Ranch, 15-VIII-1998, *Buegge, J.J. 490* (MEXU); Sabino Canyon, 27-IX-1934, *Kearney, T.H. 10329* (K); Pacific Slope, 33º 20' N, 111º 30' W, 10-VI-1884, *Pringle s.n.* (G); Near Tuczon, 32º 14' N, 110º 59' W, VI-1881, *Pringle s.n.* (G). **California**: Maclinca Mts. S. Ana (Aria), IX-1882, *Lemmon, Herb. s.n.* (G). **New Mexico**: 31º 50' N, 106º 30' W, X-1849, *Wright, C. 136* (K). **Oklahoma**: Prairie, 3 m NE of Norman, 34º 45' N, 101º 15' W, 24-VI-1937, *Barkley, F.A. 1498* (K); 3.3 mi. N of Alex, 34º 52' N, 103º 15' W,-VI-1963, *Hill, M.O. 292* (G); 8 mi E Butler on Hwy, 4-VII-1977, *Seigler, D.S. 10741* (MEXU). **Texas**: Stults Prairie, SW corner of Coit Rd. And belt Line Rd, 18-VI-1957, *Correll, D.S. 16818* (MEXU); near Dallas, 32º 50' N, 96º 50' W, May, *Curtiss 719* 1835, *Drummond 156* (G, K, OXF); along roadside near Kyle, 16-IV-1940, *Lundell 8926* (K, MEXU). VENEZUELA. **Aragua**: 3 km de Maracay, vía Maracay-Valencia, antes del paje a La Cabrera, 12-I-1995, *Cárdenas de G., L. 4059* (MEXU). **Tachira**: Saisayal, 8º 02'40'' N, 71º 48'30'' W, 2650 m, 10-X-1965, *Bernardi, L. 11006* (G, K); La Laja, Dto. Capacho, 7º 53'17'' N, 72º 10'53'' W, 1400 m, 14-I-1985, *Bono, J. 4355* (MO); Casco de la hacienda, 7º 40' N, 72º 24' W, 1800 m, 26-IX-1967, *Cárdenas de G., L. s.n.* (MO).

1c. Acaciella angustissima var. **texensis** (Nutt. ex Torrey & A. Gray) L. Rico, Fl. Guerrero 25: 44. 2005. *Acacia texensis* Nutt. ex Torrey & A. Gray, Fl. N. Amer. 1: 404. 1840. *Acaciella texensis* (Nutt. ex Torrey & A. Gray) Britton & Rose, N. Amer. Fl. 23: 100. 1928. *Acacia filicioides* var. *texensis* (Nutt. ex Torrey & A. Gray) Small, Bull. New York Bot. Gard. 2: 93 (1901). *Acacia angustissima* var. *texensis* (Nutt. ex Torrey & A. Gray) Isely, Sida 3: 372. 1969.

Type: United States: Texas, T. *Drummond 155* (holotype, NY!; isotypes, K!, NY!, OXF!, W!).

Acacia cuspidata Schldl., Linnaea 12: 573. 1838, non *A. cuspidata* Cunn. ex Benth., London J. Bot. 1: 337. 1842. *Acacia angustissima* var. *cuspidata* (Schldl.) Benson, Amer. J. Bot. 30: 238. 1943.

Type: Mexico: *Mühlenpfort s.n.* (lectotype, designated here, HAL, fragment of lectotype US!; photograph of type, K! ex HAL).

Acacia hirta Torrey & A. Gray, Fl. N. Amer. 1: 404. 1840. *Acaciella hirta* (Torrey & A. Gray) Britton & Rose, N. Amer. Fl. 23: 102. 1928. *Acacia angustissima* var. *hirta* (Torrey & A. Gray) B.L. Robinson, Rhodora 10: 33. 1908.

Type: United States: Arkansas, Red River & Arkansas, *Nuttall s.n.* (lectotype, designated here, NY!).

Acacia angustissima var. *chisosiana* Isely, Sida 3: 370. 1969.

Type: United States: Chisos Mts. Top of Divide (of Wilson), 27-VII-1937, *Warnock 20719* (holotype, NY!).

Acacia angustissima var. *oaxacana* B.L. Turner, Phytologia 81: 14. 1996.

Type: México: Oaxaca, 5 km al SE de Cuicatlán, por la desviación a San Pedro Ocotipac, 27 Aug. 1980, *F.G. Madrano* [*González Medrano*] *F-1568* (holotype, TEX; isotype, MEXU!).

Shrub to 3(6) m tall, twigs and branches glabrescent. *Leaflets* usually glabrous, occasionally with very shortly ciliate margins; pinnae to 6(8) pairs per leaf. Peduncles without pearl glands. Fig. 4 c, d.

Distribution. Mexico, north to Oaxaca and Puebla; United States: Arizona, Texas, New Mexico. Fig. 6. Materials outside the American continent are not represented in Fig. 6.

Habitat. Mainly in dry thorny scrub, also in seasonally dry forest, mixed *Quercus-Pinus* forest, secondary *Quercus* forest and grassland; it grows in limestone and acid soil and on igneous parent rock. Alt. (250)800-1300 m.

Phenology. Flowering May to November, fruiting July to February.

Vernacular names and uses. Kalbarrioh, hpahtlah (Nahuatl)

Taxonomic comments. Isely (1969) saw *A. angustissima* var. *chisosiana* only in herbarium material and distinguished it from *A. angustissima* var. *texensis* because of its woody habit, and the number of pinnae and leaflets. Later, although he recognised the varieties, he suggested (Isely, 1998) that *A. angustissima*

var. *chisosiana* probably represents one of the several specialised ecotypes of the *texensis* complex. Numerous specimens in both the herbarium and the field have shown that these characters are highly variable, *A. angustissima* var. *chisosiana* is here included as a synonym of e *A. angustissima* var. *texensis*. Turner (1996) described *Acacia angustissima* (Mill.) Kuntze var. *oaxacana* Turner; the type specimens under this name correspond to *Acaciella angustissima* var. *texensis* which Turner did not include in his synopsis.

Conservarion status. Acaciella angustissima var. *texensis* has a broad distribution in the United States and Mexico. It has been noted as abundant and in one case as a "colonial aggressive shrub"; this taxon clearly has invasive tendencies and is therefore given a rating of Least Concern (LC).

Representative specimens

AUSTRALIA. **Queensland**: Rosebank Research Station, 23º 40' S, 144º 20' E, *Fanbairn, E. 11* (K). MEXICO. **Chihuahua**: 21 km NW of Escalón, E of hwy to Jiménez, Microwave relay station, 26º 57' N, 104º 35' W, 1650 m, 7-VII-1972, *Chiang, F. 8309* (MEXU); S and SE of Mina La Nueva Esperanza on the Eastern slope of Sierra Morrion, 28º 55'30'' N, 105º 33' W, 10-VII-1972, *Chiang, F. 8406* (MEXU). **Coahuila**: 1.5 km. W of Tanque La Mula which is NE of Rancho Piedra Azul and of Pico de Centinela, 29º 19' N, 102º 35' W, 1275 m, 27-VII-1973, *Johnston, M.C. 11750* (MEXU); Vicinity of Santa Elena Mines, Sierra de las Cruces, 27º 28' N, 102º 33' W, 9-VI-1941, *Stewart ,R.M. 401* (BM, MEXU). **Durango**: Ramos, 25º 28' N, 105º 12' W, 11-VIII-1898, *Nelson, E.W. 4712* (K); Amarraderos, Mpio. de Ocampo, 24º 44' N, 104º 39' W, 18-IX-1980, *Ochoa, G.J. 22* (MEXU); Fco. Primo de Verdad. Mpio. San Juan del Río, 24º 47' N, 104º 27' W, 10-VII-1984, *Tenorio, P. 6377* (MEXU). **Guerrero**: Oapán, between Oapán and San Miguel Tecuiciapán, 17º 56' 54'' N, 99º 25' 53'' W, 600 m, 18-VIII-2003, *Amith, J. 498* (K,

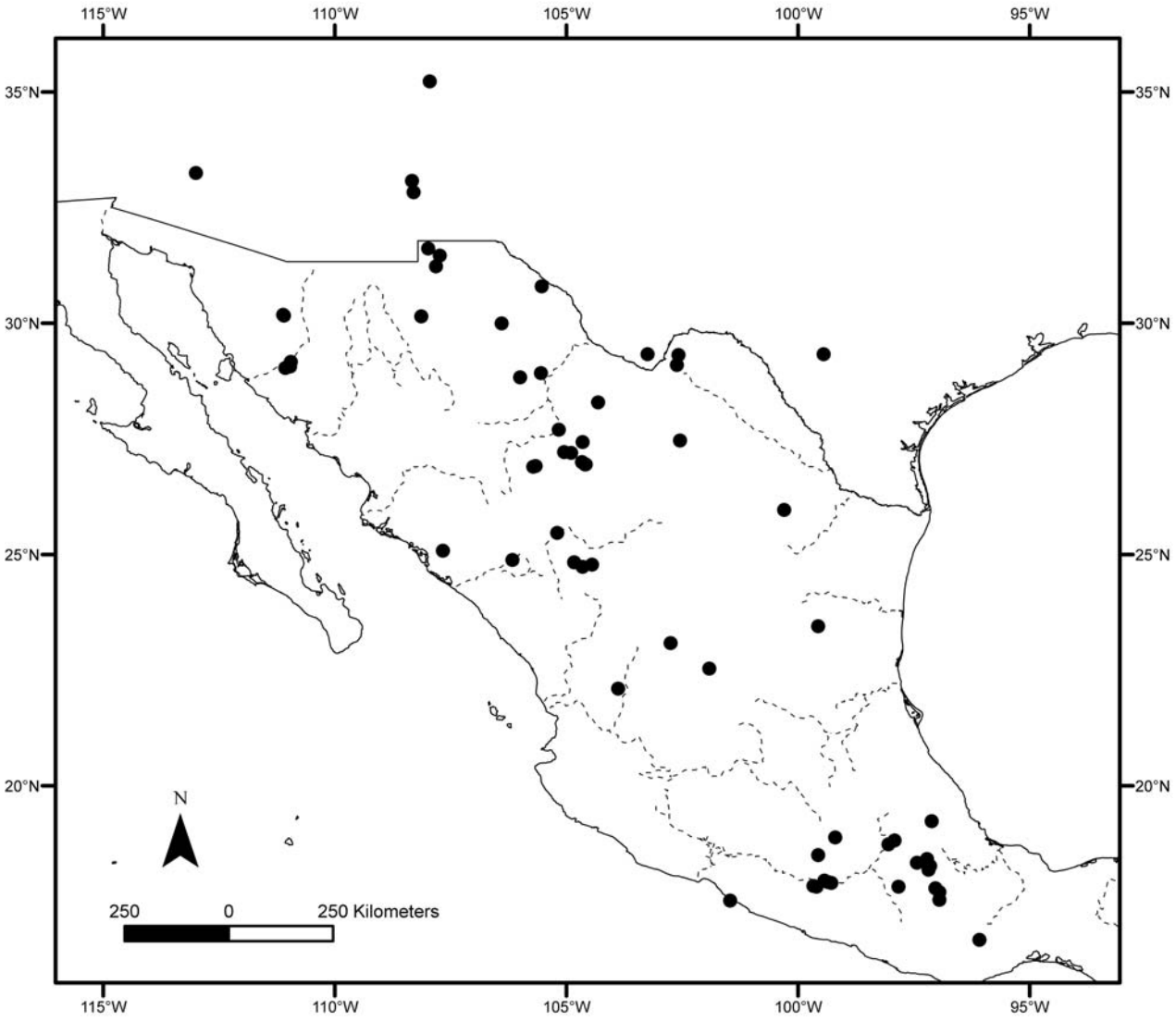

Fig. 6. Geographical range of *Acaciella angustissima* var. *texensis*.

MEXU); km 3,5 de Xalitla por la brecha de San Juan Tetelcingo, 17º 55' N, 99º 21' W, 530 m, 13-VII-1978, *Blanco 433* (MEXU); 3,36 km al E de San Francisco Ozomatlán, 17º 54' N, 99º 17' W, 700 m, 27-X-1988, *Vaca, Iris 116* (FCME, K); 1 km al NE de San Francisco Ozomatlán, 17º 54' N, 99º 17' W, 600 m, 30-X-1988, *Vaca, Iris 164* (FCME, K); 3,36 km al E. de San Francisco Ozomatlan, 17º 54' N, 99º 17' W, 700 m, 29-X-1988, *Vaca, Iris 194* (FCME, K). **Hidalgo**: *Coulter s.n.* (K, MEXU). **Jalisco**: 1 km antes de llegar al puente del río Santiago, carr. Guadalajara-Colotlán, 22º 06', 103º 53' W, 750

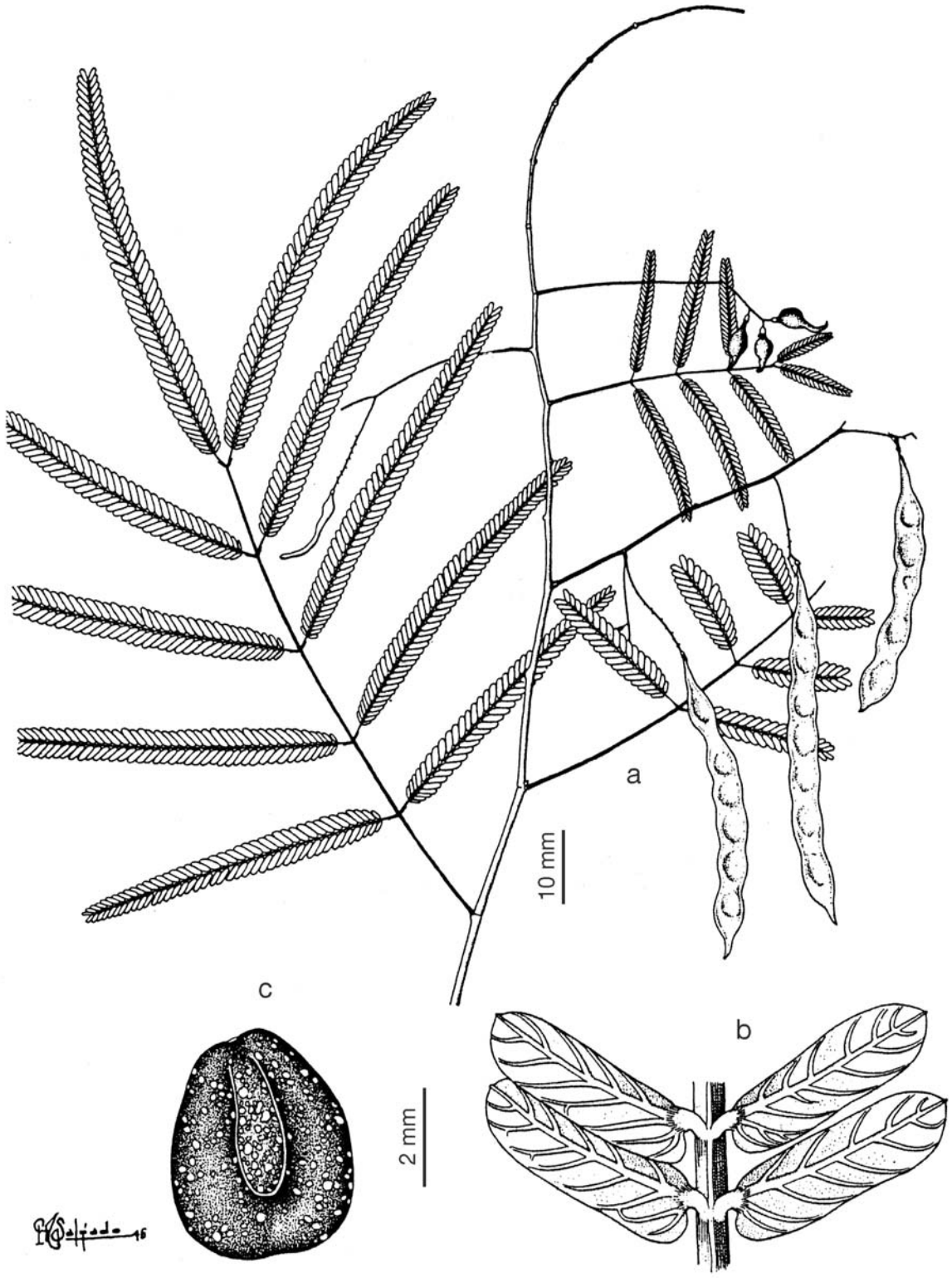

Fig. 7. *Acaciella barrancana*: **a,** habit and infrutescence; **b,** detail of leaflets; **c,** seed, front view showing pleurogram. From *H.S. Gentry 5298*. Drawn by E. Salgado, from Brittonia 6: 313 (1948).

m, 15-II-1992, *Reynoso, J.J. 554* (K). **Nuevo León**: Sabinas de Hidalgo, 25º 58' N, 100º 18' W, 15-IX-1937, *Kenoyer, L. s.n.* (MO). **Oaxaca**: Tlacolula, 1,5 km al NW de Guegolache carr. a Totolapán, 16º 40' N, 96º 05' W, 950 m, 4-VIII-1987, *Acosta, S. 778* (MEXU); 9 km al N de la desv. a Tonaltepec, 17º 32' N, 96º 57' W, 1250 m, 25-VIII-1976, *Sousa, M. 6133* (K, MEXU, MO). **Puebla**: Cañada de Acatzizzimitla, Mpio. Atoyatempán, 18º 49' N, 97º 55' W, 1850 m, 28-VI-1982, *González Medrano 12688* (MEXU); Sierra de Guadalupe, 4 km al E de Tlanepantla, Mpio. Tlanepantla, 19º 14' N, 97º 07' W, 2-VI-1973, *Moreno, C., S. 230* (MEXU); loma tendida, al NW de Zapotitlán de las Salinas, 18º 20' N, 97º 26' W, 1540 m, 23-IX-1979, *Zavala, J.A. 111* (XAL). **San Luis Potosí**. Near los Canos [Caños], 22º 32' N, 101º 55' W, 15-X-1902, *Palmer, E. 218* (BM, K). **Sinaloa**: 24º 53' N, 106º 10' W, 2000 m, 5-XII-1939, *Gentry H.S. 5135* (MEXU); Culiacán, Bagrecitos, 27 km al NE de Tepuche, 25º 05' N, 107º 40' W, 680 m, 9-XII-1982, *Tenorio, P. 3001* (MEXU). **Sonora**: 2,5 km S de Hermosillo, 29º 10' N, 110º 57' W, 250 m, 26-VIII-1992, *Búrquez, A. 92-355* (MEXU); 8 mi. S of Benjamin Hill, 30º 11' N, 111º 07' W, 2800 m, 28-XII-1976, *Johnson, C.D. 220-76* (MEXU); 4.4 miles by road so. Benjamin Hill Junction, 30º 10' N, 111º 06' W, 2350 m, 12-VIII-1958, *Turner, R.M. 133* (MEXU). **Tamaulipas**: Santiaguillo, 7 km al N de Magdaleno Aguilar, 23º 27' N, 99º 34' W, 1800 m, 18-IX-1976, *González Medrano 9787* (MEXU). **Zacatecas**: 20 mi. NW Fresnillo, Ca. 20 miles NW, along Highway 45 to Durango, 23º 05' N, 102º 45' W, 2150 m, 22-VIII-1975, *Davidse, G. 10010* (MEXU). USA. **Arizona**: South-central Arizona, south of the town Globe, S of Pioneer Pass, 33º 15' N, 113º 00' W, 1500 m, 17-VIII-1980, *Forbes, S. 1370* (MEXU). **New Mexico**: Sonora Zone, W of S end of Oregon Mts, 1500 m, 9-IX-1930, *Fosberg, F.R. S3730* (MEXU); Mangas Springs, 18 km NE of Silver City, 35º 14' N, 107º 57' W, 1600 m, 5-IX-1903, *Metcalfe, O.B. 250* (G); 18 Mi. NE Silver City,, 33º 05' N, 108º 20' W, 1600 m, 5-IX-1903, *Metcalfe, O.B. 254* (K). **Texas**: *Berlandier 3151* (G, K); Rocky Mts. side, 15-VIII-1931, *Clarke, O.M. 4162* (G); 29-V-1932, *Clarke, O.M. 4779* (G); 2 mi S of Salt Flat, 6-VI-1969, *Correll, D.S. 37411* (MEXU).

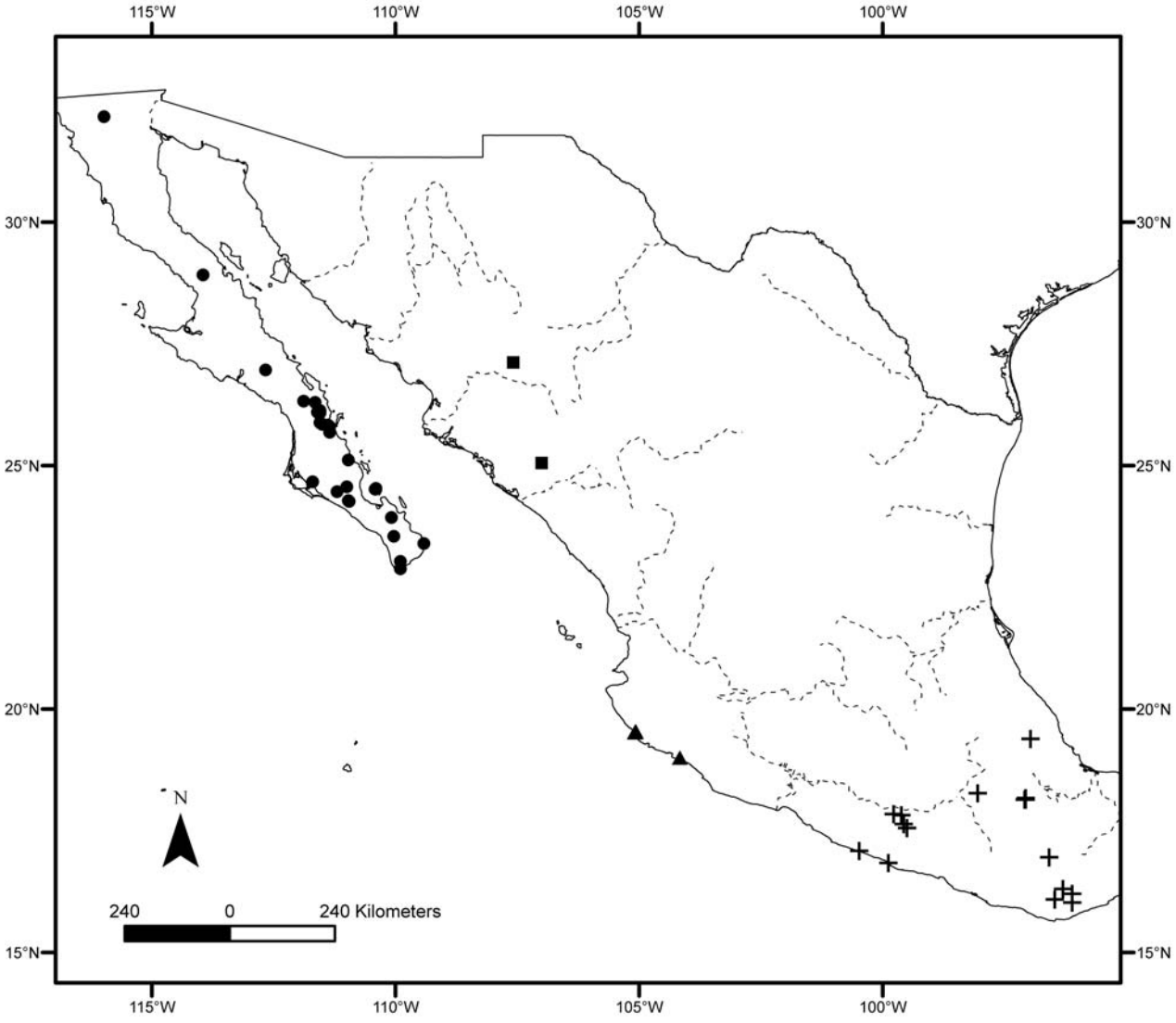

Fig. 8. Geographical range of *Acaciella barrancana* (■), *A. bicolor* (+), *A. chamelensis* (▲) and *A. goldmanii* (●).

2. Acaciella barrancana (H. Gentry) L. Rico, **comb. nov.**

Acacia barrancana H. Gentry, Brittonia 6(3): 312, fig. 2. 1948, basion.

Type: Mexico: Durango; Sierra Tres Picos [Cerro Tres Picos, 25º03' N, 107º00' W], 20 Dec. 1939, *H.S. Gentry 5298* (holotype, MICH; isotypes, MEXU!, MO!, NY, US).

Shrub to 2 m tall, glabrous. *Stipules* not seen. *Leaves* to 16 cm long; petiole 2-3(4) cm long, channelled above, glabrous; rachis 8-12 cm long, glabrous, with up to 5 pairs of pinnae per leaf; pinnae 7-10 cm long; paraphyllidia 2 mm long; leaflets 30-50 pairs per pinnae, 4-9 × 1-3 mm, oblong, base truncate, apex acute, sometimes rounded, the venation brochidodromous, the midvein submarginal at base, central at apex, glabrous, membranaceous. *Inflorescences* not seen. *Legume* 6-6.5 × 6-8 × 0.3 cm, flat, straight, valves chartaceous, conspicuously reticulate-veined, glabrous, acute at the base and apex; stipe 0.5 cm long; beak 3 mm long. *Seeds* 5-6 per fruit, circular in outline, spherical, 4-5 × 4.3 × 1.5-1.8 mm. Fig. 7.

Distribution. Mexico north, Chihuahua and Durango. Fig. 8.

Habitat. Dry scrub with palms and *Quercus*. Alt. 1000-1200 m.

Phenology. Fruiting in October and December.

Taxonomic comments. This is a poorly known species. Only the type and one other collection from Chihuahua have been seen. Its leaflets are glabrous and have a well marked brochidodromous venation. Material in flower has not been found in herbaria. Gentry (1948) says that the calyx is persistent and cupular, without giving any measurements, and that the fruit is depressed (constricted) between the seeds. Its sister species appears to be *A. hartwegii* which has fewer pairs of pubescent leaflets and a wider geographical distribution.

Conservarion status. Acaciella barrancana is only known from two localities in the provinces of Durango and Chihuahua. This species may be very rare or simply under collected. A rating of Data Deficient (DD) is advised until the range and threats to this species are more fully understood.

Representative specimens

MEXICO. **Chihuahua**: Barranca de Batopillas, E of La Bufa, E slopes of Arroyo la Bufa, 27° 07' N, 107° 35' W, 1000 m, 6-X-1975, *Bye, R. 6938* (MEXU). **Durango**: Sierra Tres Picos [Cerro Tres Picos], 25° 03' N, 107° 00' W, 1150 m, 20-XII-1939, *Gentry H.S. 5298* (MEXU, MICH, MO, NY).

3. Acaciella bicolor Britton & Rose, N. Amer. Fl. 23: 102. 1928.

Type: Mexico: Guerrero, Acapulco and vicinity, *Palmer 297* (holotype, NY!; isotypes, BM! G!, K!, US!).

Acacia velvae L. Rico, Bol. Soc. Bot. Mexico 43: 67-68, fig. 1, 1982.

Type: Mexico: Guerrero, Municipio de Zumpango del Río, 6 km NE de Xochipala, *J.L. Contreras 78* (holotype, MEXU!; isotypes, ENCB!, FCME!).

Shrub or *perennial herb* to 4 m tall, densely hispidulous. *Stipules* broadly ovate, 5 mm long, striate with an apical blackish area, fugacious. *Leaves* 4.5-8(12) cm long; petiole (1.3)3-4 cm long, terete, densely hispidulous; rachis 1.5-5(8) cm long, shortly strigose, with 3-10 pairs of pinnae; pinnae 2-6(9) cm long; paraphyllidia 1 mm long; leaflets 15-32 pairs per pinna, 6-15 × 2-6(8) mm, narrowly elliptic, base oblique, apex rounded, slightly mucronate, venation not visible, densely tomentose on both surfaces, membranaceous. *Inflorescences* consisting of clusters of 2-4 capitulum-like racemes in branched axils; peduncles 1-1.5 cm long; tomentose, without pearl glands, with an inflorescence bract below the capitulum, fugacious; floral bract 1.2-1.5 mm long, pubescent outside, clavate, fugacious; pedicels 2 mm long, glabrous; flowers white, yellow when dry, in short racemes up to 1.5 cm in diam. at anthesis. *Calyx* 1 mm long, 5-lobed, the lobes less than ¼ of the length of whole calyx, tomentose. *Corolla* 2.5 mm long, 5-lobed, the lobes more than half the whole corolla length, tomentose. *Stamens* 6-7 mm long. *Ovary* 0.75-1 mm long, glabrous, short-stipitate, the stipe 0.35 mm long; basal nectary 0.5 mm high. *Legume* 6-6.5 × 1-1.4 × 0.3 cm, flat, straight, valves chartaceous, conspicuously reticulate, usually velutinous, occasionally glabrous, acute at the base and apex; stipe 1 cm long; beak 1 mm long. *Seeds* 6-12 per fruit, only seen immature. Fig. 9.

Distribution. Mexico: Guerrero, Oaxaca, Puebla and Veracruz. Fig. 8.

Habitat. Low seasonally dry forest, mesophyllous forest, *Quercus* and mixed *Pinus-Quercus* forest. In deep soils (> 80 cm) rich in humus, usually on limestone. Alt. 1300-2300 m.

Phenology. Flowering in April-June, August-September and October, fruiting in February and August-September.

Taxonomic comments. Acaciella bicolor is easy to recognise because of its tomentose, and relatively large, 5 mm long stipules, these are striate and often have a black apex.

Conservarion status. Although endemic to a few states and across the trans-volcanic belt in Mexico, *A.*

Fig. 9. *Acaciella bicolor:* **a,** habit and inflorescences; **b,** leaf; **c,** leaflet upper surface; **d,** leaflet undersurface; **e,** stipule showing pubescence; **f,** leaf fragment showing channelled rachis and paraphyllidia on pinnae bases, and pubescence; **g,** inflorescence fragment; **h,** floral bract; **i,** calyx, opened out; **j,** corolla, opened out; **k,** androecium, many stamens have been removed, gynoecium and basal nectary; **l,** fruits. a-k, from R. Torres 1217; l, from Tenorio & al. 1217. Drawn by P. Halliday.

bicolor does not meet the area thresholds for a threatened category under criterion B. Evidence of habitat loss due to deforestation and settlement expansion in conjunction with a lack of coverage in protected areas indicates this taxon may be eligible for a threatened category under criterion A, a rating of VU A3c is advised.

Representative specimens

MEXICO. **Guerrero**: Atoyac San Jeronimo, Río, 9 Mi. WSW of Xochipala, road from Milpillas to Atoyac de Alvarez, 17º 05' N, 100º 29' W, 1800 m, 30-VI-1982, *Thomas, W.W. 2841* (MEXU). **Oaxaca**: 20 km al SW de Yosocuta y 3 km al SW de la desv. a San Miguel Papalutla. Distrito de Huajuapán, 16º 57' N, 96º 35' W, 1900 m, 18-VI-1982, *Cedillo, R. 1438* (MEXU); Mpio. San Miguel del Puerto, Cerro Lobo, 16º 11'64'' N, 96º 06'33'' W, 2092 m, 27-V-1903, *Pascual, J. 777* (MEXU). **Puebla**: 3 km NE de Acatlán de Osorio, 18º 16' N, 98º 03' W, 1150 m, 23-VI-1984, *Hernández H.M. 261* (MEXU). **Veracruz**: Teocelo, Cañón de Comalapán o las Canastas, 19º 23' N, 96º 58' W, 22-X-1975, *Calzada, J.I. 2067* (MEXU, XAL).

4. Acaciella chamelensis (L. Rico) L. Rico, **comb. nov.**

Acacia chamelensis L. Rico, Kew Mag. 10(2): 66. 1993, basion.

Type: México; Jalisco, Municipio La Huerta, Estación de Biología Chamela, 19º 30' N, 105º 03' W, 4 Feb. 1983, *A.S. Magallanes 3987* (holotype, MEXU!).

Shrub up to 6 m tall, yellowish-hirsute. *Stipules* filiform, 7 mm long, pubescent, long-ciliate, fugacious. *Leaves* up to 15 cm long; petiole 3-6.5 cm long, channelled, hirsute or strigulose; rachis up to 8.5 cm long, channelled, hirsute or strigulose, with 2-4 pairs of pinnae; pinnae 6-8.5 cm long; paraphyllidia 1-1.5 mm long; leaflets 6-10 pairs per pinna, 8-22 × 4-7 mm, elliptic, base and apex acute, venation brochidodromous, glabrous or slightly pubescent above, margin ciliate, chartaceous. *Inflorescence* consisting of clusters of 2-4 capitulum-like racemes on a main axis to 20 cm long, hirsute; peduncles 1-1.5 cm long; glabrous, without pearl glands; inflorescence bracts filiform, fugacious, ciliate, one at base of peduncle, 6-7 mm long, another about mid-way up or closer to the raceme, 2 mm long; floral bract c. 1.5 mm long, glabrous, clavate, fugacious; pedicels 1-1.5 mm long, glabrous; flowers white, becoming orange when dry; racemes up to 17 mm long at anthesis. *Calyx* 1-1.3 mm long, 5-lobed, the lobes less than ¼ the length of the whole calyx, glabrous. *Corolla* c. 2.5 mm long, 5-lobed, the lobes to more than half the whole corolla length, glabrous. *Stamens* 4.5 mm long. *Ovary* 1 mm long, glabrous, short-stipitate, the stipe 0.5 mm long; basal nectary 0.75 mm high. *Legume* 4.5-5 × 1.5-1.8 × 0.3 cm, flat, straight, valves chartaceous, conspicuously reticulate-veined, glabrous, rounded at the base, acute at the apex; stipe not seen complete; beak present, 3 mm long. *Seeds* 6-8 per fruit, only seen immature. Figs. 10, 11.

Distribution. Mexico: Jalisco and Colima. Fig. 8.

Habitat. Low deciduous forest with seasonal rains during July and September.

Phenology. Flowering in February and September, fruiting in November.

Taxonomic comments. The species has relatively large glabrous leaflets with conspicuous brochidodromous venation.

Conservarion status. The populations of *Acaciella chamelensis* in Chamela Biological Station (UNAM) are well protected and ecologically managed. The population to the south of Manzanillo may well be locally extinct as it was collected in 1979 and the region

Fig. 10. *Acaciella chamelensis*: flowering habit. From *Kew Mag.* 10: 66 (1993), drawn by C. King, reproduced here with permission.

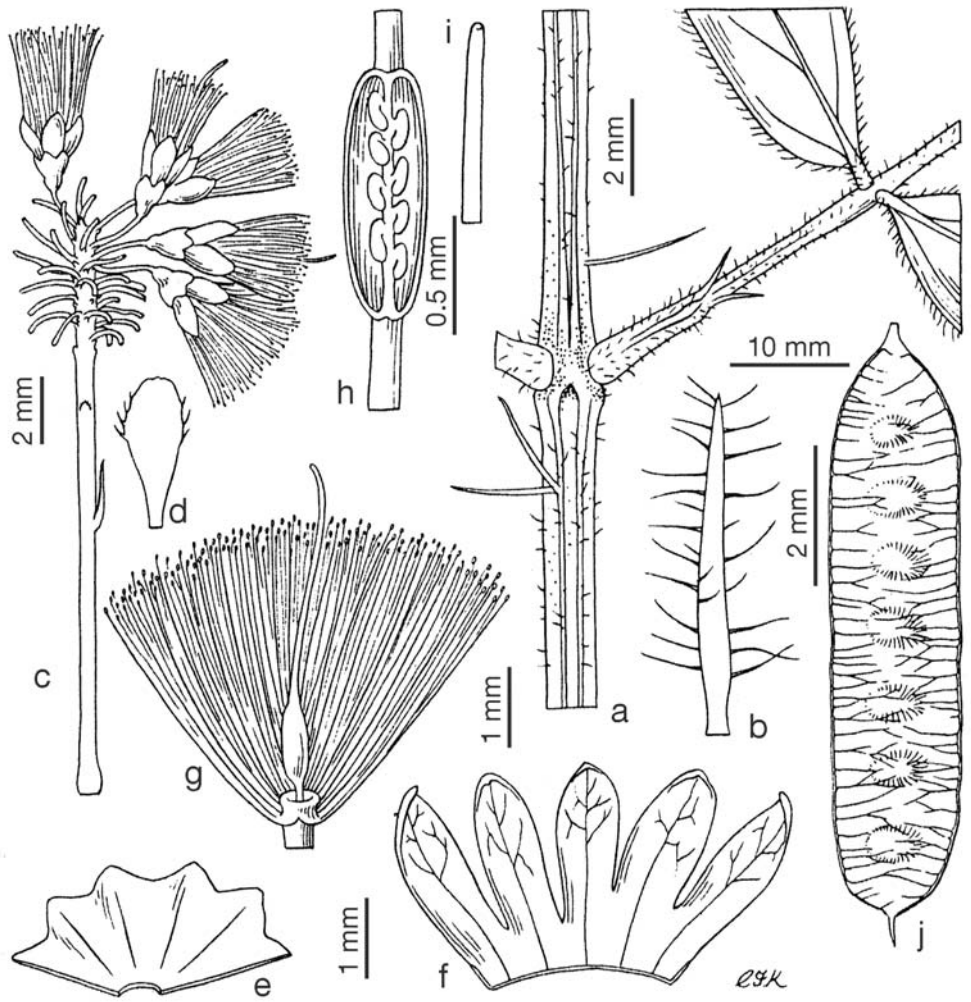

Fig. 11. *Acaciella chamelensis*: **a,** leaf fragment showing channelled rachis and paraphyllidia on pinnae bases and pubescence; **b,** stipule; **c,** inflorescence fragment; **d,** floral bract; **e,** calyx, opened out; **f,** corolla, opened out; **g,** gynoecium, androecium and ovary stipe with basal nectary; **h,** ovary, longitudinal section; **i,** style apex showing porate stigma; **j,** fruit. All from *L. Rico 832B & Windsor-Shaw*. Drawn by C. King.

is now extensively cultivated. The expansion of urban areas and settlements are also a threat to the habitat. A rating of VU D2 is advised. The species is being cultivated at Kew, where it has produced flowers since 1992, although no fruit has set.

Representative specimens

MEXICO. **Colima**: Cuyutlán, Laguna de, 19º 00' N, 104º 10' W, 2-IX-1979, *Magallanes, J.A.S. 1831* (CAS, K, MEXU, MO, MSC, NY). **Jalisco**: eje central cruce con camino antiguo, Estación Chamela, 19º 32' N, 105º 05' W, 4-II-1983, *Magallanes, J.A.S. 3987* (MEXU); eje central cruce con camino antiguo, Estación de Investigación, 19º 31' N, 105º 05' W, 11 m, 4-II-1983, *Rodríguez B., D. 3987* (MEXU).

5. Acaciella glauca (L.) L. Rico, **comb. nov.**

Mimosa glauca L., Sp. Pl.: 520. 1753, basion. *Acacia glauca* (L.) Moench, Meth. Pl.: 466. 1794.

Type: "Habitat in America" (lectotype, designated by: de Wit 1961, L, Herb. *A. van Royen s.n.*, sheet no. 908.132-54).

Acaciella curassavica Britton & Killip ex Killip, J. Washington Ac. Sci. 24: 47. 1934. *Acacia curassavica* (Britton & Killip ex Killip) Stehlé, Bull. du Mus. Hist. Natl., ser. 2, 18: 191. 1946.

Type: Netherlands Antilles: Curaçao, limestone rocks near Willemstad, 20-27 March, 1913, *N.L. Britton & J.A. Shafer 2943* (holotype, NY!; isotypes, U, US).

Shrub to 6 m tall, glabrous. *Stipules* linear, 5 mm long, fugacious. *Leaves* 10(15) cm long; petiole 2.5-3.5 cm long, terete, glabrous or sparingly strigose; rachis 4-5 cm long, glabrous or sparingly short-strigose, with 2-8 pairs of pinnae; pinnae 4-5 cm long; paraphyllidia <1 mm long; leaflets 6-21 pairs per pin-

na, 3.5-9 × 3-6 mm, oblong-elliptic, base obtuse, apex rounded to slightly acute, venation reticulate (brochidodromous), visible only on the under surface, glabrous on both surfaces or occasionally short-strigose below, margins slightly involute on basal half, membranaceous. *Inflorescences* consisting of clusters of 2-3 capitulum-like racemes on main axis to 12 cm long, glabrous; peduncles 1-1.5 cm long, glabrous, without pearl glands; a single inflorescence bract at the base of each raceme peduncle, linear, 2-2.5 mm, glabrous, fugacious; floral bract 1 mm long, glabrous, clavate, fugacious; pedicels 1 mm long, glabrous; flowers white, yellow when dry, in short racemes, 1.5-2 cm long, when elongated, or 1.5 cm diam. when capitulum-like at anthesis. *Calyx* 1 mm long, 5-lobed, the lobes less than ¼ of the length of the whole calyx, glabrous. *Corolla* 2-2.5 mm long, 5-lobed, the lobes to more than half the whole corolla length, glabrous. *Stamens* 6-7 mm long. *Ovary* c. 1 mm long, glabrous, short-stipitate; the stipe 0.4 mm long; basal nectary 0.4 mm high. *Legume* 4.5-8 × 1.2-1.5 × 0.3 cm, flat, straight; valves chartaceous, conspicuously reticulate veined, glabrous, acute at the base and apex; stipe (0.6)1-1.5 cm long; beak 1-2.5 mm long. *Seeds* 8 per fruit, broadly ellipsoid, 3.5 × 3 × 1.8 mm. Fig. 4 e, f.

Distribution. South America: Venezuelan coast; Caribbean: Barbados, Curaçao (Netherlands Antilles), St. Vincent and Martinique, Fig. 12. Introduced to Australia, Thailand, Indonesia and West Java.

Habitat. From sea level to 500 m.

Phenology. Flowering and fruiting in January to February.

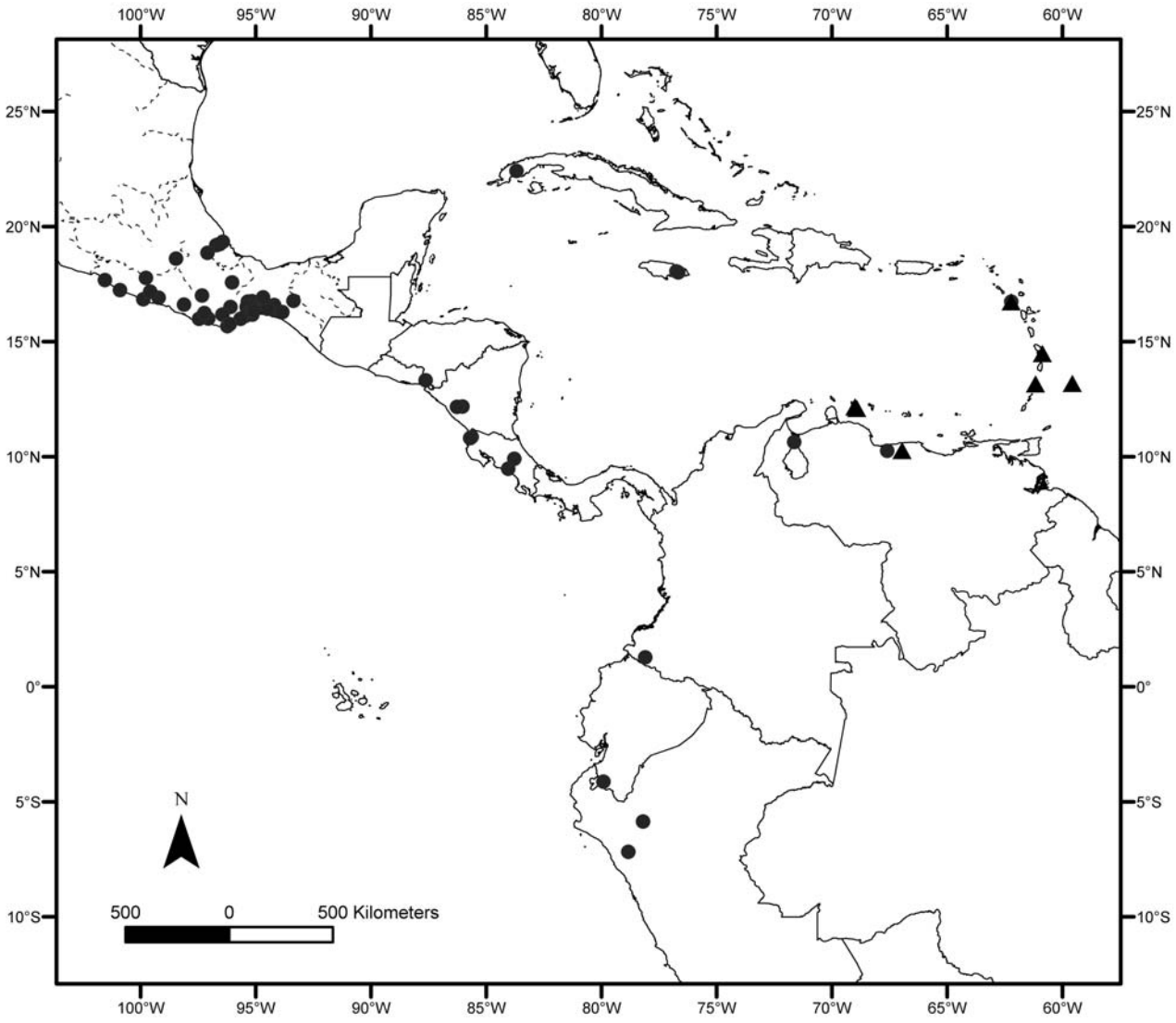

Fig. 12. Geographical range of *Acaciella glauca* (▲) and *A. villosa* (●).

Taxonomic comments. Acaciella glauca specimens have glabrous leaflets with plane and thickened margins, or if these are involute, they are only on the basal half, occasionally margins are short ciliate. The species also has a very faint brochidodromous leaflet venation, this is visible only on the lower surface. In contrast, the apparently related *A. villosa* has densely pubescent leaflets with margins completely involute. In some literature, e.g. Bässler (1998), *A. villosa* has been included in the synonomy of *A. glauca*, but analysis of the types show the two to be different. Additionally, *A. glauca* is restricted to a few Caribbean Islands and north Venezuela (e.g. *Johnson 3664-85*) whereas *A. villosa* has a broader continental distribution and in the Caribbean area is recorded as native only in Jamaica. Type material of *A. curassavica* (*Britton* & *Shafer 2943*) in NY has glabrous twigs and leaflets, the fruit is up to 6 cm long and 1.5 cm wide; *van Royen s.n.* (the type of *A. glauca*) does not differ from *Britton* & *Shafer 2943* in any significant way and the two are here considered to be conspecific.

Conservarion status. The natural range of *Acaciella glauca* is difficult to determine as it appears to have been introduced to some Pacific Islands, e.g. Fiji, as well as into Australia and more recently China. It is listed as introduced and invasive on the Pacific Island Ecosystems at Risk list (www.hear.org/Pier/). Although possibly threatened in some localities, e.g. on Montserrat, given the recent volcanic activity on the island and the possible small area of occupancy (AOO), the species is rated as being of Least Concern (LC) due its invasive nature and large extent of occurrance (EOO).

Representative specimens

BARBADOS. **St. John**: 13º 11' N, 59º 34' W,-I-1940, *Goodwing, E.G. 488* (BM). INDONESIA. **Bogor**: Bodjong Gedeh, 250 m, 21-II-1951, *Nedi & Idjan 438* (K). MARTINIQUE. 14º 29' N, 60º 52' W, *van Rohr 134* (BM); *van Rohr 336* (BM). MONSERRAT. **Isles Bay**: [Saint Peter Parish, Illes] Bay, 16º 44' N, 62º 13' W, 193 m, 17-II-1980, *Howard, R.A. 19623* (BM, G). **Olveston**: 16º 44' N, 62º 13' W, 193 m, 14-I-1961, *Howard, R.A. 15177* (BM); Olveston area, roadside, 16º 44' N, 62º 13' W, 193 m, 16-IV-1979, *Howard, R.A. 19177* (BM). NETHERLANDS ANTILLES. **Curaçao**: Near Willemstad, 12º 06' N, 68º 55' W,-III-1913, *Britton, N.L. 2943* (NY);-XI- 1970, *Broeders, Arnoldo Fr. 3931* (BM). ST. VICENT. **Glen Farm**: 13º 10' N, 61º 10' W, 100 m, 3-II-1944, *Beard, J.S. 223* (K). **St. George Parish**: 13º 10' N, 61º 10' W, 14-I-1962, *Colley, G.R. 8152* (K). THAILAND. **Central Bangkok**: Royal Forest Department, Royal Forest Depl. Bangkhen, 22-XI- 1960, *Tanwuttho, A. 40367* (K). VENEZUELA. **Miranda**: 16 km W of Paracotos, 10º 16'17'' N, 66º 57'10'' W, 430 m, 17-I-1985, *Johnson, C.D. 3664-85* (MO).

6. Acaciella goldmanii Britton & Rose, N. Amer. Fl. 23: 99. 1928.

Acacia goldmanii (Britton & Rose) Wiggins, Contr. Dudley Herb. 3: 68 (1940).

Type: Mexico: Baja California, Lower California Desert, between San Pedro and Tres Pachilas, *Nelson & Goldman 7336* (lectotype, designated here, US!; isolectotype, NY!).

Acacia macmurphyi Wiggins, Contr. Dudley Herb. 3: 68. 1940.

Type: Mexico; Baja California, 3-4 mi. north of Comondu, 26-IV-1931, *Wiggins 5477* (holotype, DS; photograph of holotype, MEXU!).

Shrub to 3 m tall, glabrous. *Stipules* 2.25 mm long, to 1 mm wide, fugacious. *Leaves* 3-9 cm long; petiole 1.3-3 cm long, channelled, glabrous or glabrescent; rachis 2-3.5 cm long, usually glabrous, with (3)4-5 pairs of pinnae; pinnae (2.5)3-5.5 cm long; paraphyllidia up to 1 mm long; leaflets 14-28 pairs per pinna, 6-12 × (0.8)1-1.5 mm, narrowly oblong, base rounded, apex acute, 1-veined, membranaceous, discolorous. *Inflorescences* consisting of clusters of 2 racemes in branch axils; peduncles 1.5-1.7 cm long, glabrous, without pearl glands; inflorescence bracts not seen; floral bract not seen; pedicels 0.6-0.7(0.8) mm long, glabrous; flowers white, cream when dry, in short racemes up to 13 mm long at anthesis. *Calyx* 0.6 mm long, 5-lobed, the lobes less than ¼ the length of the whole calyx, glabrous. *Corolla* c. 2 mm long, 5-lobed, the lobes to more than half the whole corolla lenth, glabrous. *Stamens* 3.5 mm long. *Ovary* 1.2 mm high, glabrous, short-stipitate, the stipe shorter than the ovary; basal nectary 0.3 mm high. *Legume* 4.5-4.7 (6) × (0.8)-1 × 0.2 cm, flat, straight, tardily dehiscent along both sutures; valves chartaceous, conspicuously reticulate-veined, glabrous, acute at the base and apex; stipe 0.7-1 cm long; beak absent. *Seeds* 4-6 per fruit, widely elliptic, 3.7-4.6 × 2.4-3.7 × 1.4-1.8 mm. Fig 13

Distribution. Endemic to Baja California, Mexico. Fig. 8.

Habitat. 0-1600 m. Dry scrub, or scrubland, often along watercourses and along the coast.

Phenology. Flowering September to April, fruiting recorded from September to January.

Taxonomic comments. The leaflets at the base of the pinnae have rounded bases, while towards the apex of the pinnae the leaflet bases are truncate. Twigs are usually blackish, a feature that makes the species easy to recognise. The stipules are up to 1 mm wide, usually persistant and the axillary leaf bud is relatively robust (to 2 mm long), black and rounded, all conspicuous characters of the species.

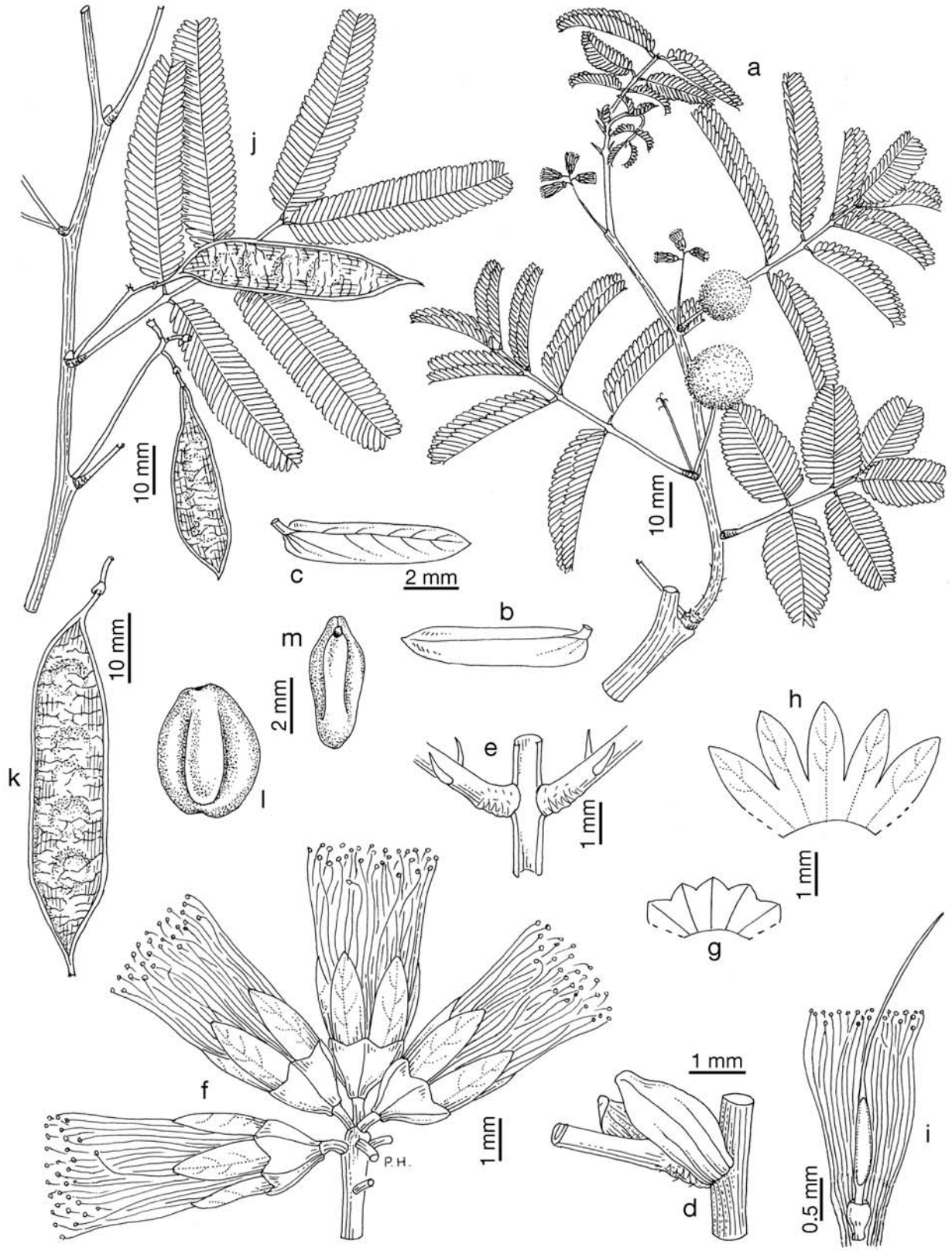

Fig. 13. *Acaciella goldmanii*: **a,** habit; leaves and inflorescence; **b,** leaflet venation on the undersurface; **c,** leaflet venation on the upersurface; **d,** wide stipules and fragment of petiole and terete stem; **e,** leaf fragment showing channelled rachis and paraphyllidia on pinnae bases; **f,** inflorescence fragment showing individual flowers and pedicels; **g,** calyx, opened out; **h,** corolla, opened out; **i,** androecium, many stamens have been removed, ovary and basal nectary; **j,** branch showing robust axillary leaf buds and mature fruits; k fruit, beak broken; **l,** seed in front view showing pleurogram; **m,** seed in profile showing micropile and connecting pleurogram. a-i, from *Hughes 1549*, j-m, from *Gentry 4124*. Drawn by P. Halliday.

Conservation status. Acaciella goldmanii is endemic to Baja California. Threats in this region include conversion of natural vegetation to buffel grass cultivation, although this is mostly in the flat, lowland areas where this species is not commonly found. The species often grows along watercourses as widely scattered individuals, so apparently occupies a small fragmented AOO. Given the available data, a rating of Least Concern (LC) is advised.

Representative specimens

MEXICO. **Baja California**: 2 km N of Cabo San Lucas on road to Todos Santos, 22º 53' N, 109º 54' W, 33 m, 26-X-1977, *Breedlove, D.E. 43441* (MEXU); NNE of Los Frailes, 23º 24' N, 109º 25' W, 200 m, 21-X-1981, *Burgess, T.L. 6253* (MEXU); Cerro Gabilan, 25º 50' N, 111º 24' W, 1300 m, 4-X-1965, *Carter, A. 5122* (BM, MEXU, TEX); El Cien, 24º 17' N, 110º 58' W, 125 m, 22-I-1992, *Hughes, C.E. 1549* (FCME, FHO, K, MEXU, MO, NY); Arroyo near km 123, NW of La Paz, 24º 28' N, 111º 12' W, 20-XI- 1959, *Wiggins, I.L. 15589* (CAS, G, K, MEXU).

7. Acaciella hartwegii (Benth.) Britton & Rose, N. Amer. Fl. 23: 102. 1928.

Acacia hartwegii Benth., Pl. Hartw.: 13 (1839) [*hartwegi*].

Type: Mexico; Aguascalientes, *Hartweg 74* (lectotype, here designated, K!; isolectotypes, BM! G!, NY!, OXF!, P!).

Acaciella prostrata Britton & Rose, N. Amer. Fl. 23: 102. 1928, non *Acacia prostrata* Lodd., 1818. *Acacia guadalajarana* Standl., Publ. Field. Mus. Nat. Hist., Bot. ser. 11: 158 (1936), [type as for *Acaciella prostrata* Britton & Rose]. *Acacia procumbens* (Britton & Rose) Bullock, Kew Bull. 1939: 2 (1939). *nom. illeg.* [type as for *Acaciella prostrata* Britton & Rose].

Type: Mexico; Jalisco, moist rocky slopes near Guadalajara, *C.G. Pringle 4478* (holotype, US!; isotypes, G!, K!, MEXU!, NY!).

Acacia leucothrix Standl., Contr. U.S. Natl. Herb. 20: 185. 1918.

Type: Mexico: San Luis Potosi, San Dieguito [22º01'N, 99º13'W, Alt. 340 m], VI-1904, *E. Palmer 143* (holotype, US!; isotype, K!).

Prostrate perennial herb or occasionally s*hrub* to 3.5 m tall, yellow-hirsute, glabrescent. *Stipules* persistent, narrowly lanceolate, 6-7 mm long, pilose, margin long-ciliate. *Leaves* (4)8-10(15) cm long; petiole 1-1.5(3) cm long, terete, sparsely hirsute; rachis (0.8)6.5-7(9.5) cm long, sparsely hirsute, with (2)6-8 pairs of pinnae; pinnae 2.3-3.5(5.5) cm long; paraphyllidia 0.75-1 mm long; leaflets (6)15-20 pairs per pinna, 3-6 × 1.5-2 mm, elliptic, base truncate, apex rounded, the brochidodromous venation evident on the lower surface, inconspicuous above, midvein subcentral, glabrous, margin long-ciliate, membranaceous. *Inflorescences* consisting of clusters of (2)4-5 axillary, capitulum-like racemes; peduncles (1.8)2.5-3(5) cm long; usually glabrous or sparsely hirsute, without pearl glands; inflorescence bracts 2, one near to the inflorescence base, 1 mm long, the other about 1/3 up the peduncle, 2 mm long, both bracts glabrous, with margins long-ciliate, elliptic in shape, fugacious; floral bract 1 mm long, glabrous, long-ciliate, clavate, fugacious; pedicels 1 mm long, glabrous; flowers white, drying pink to orange; racemes 1-1.5 cm in diam. at anthesis. *Calyx* (0.75)1.2 mm long, 5-lobed, the lobes less than ¼ the length of the whole calyx, glabrous or slightly ciliate. *Corolla* 2.5-3 mm long, 5-lobed, lobes to more than half the whole corolla length, glabrous. *Stamens* 5 mm long. *Ovary* 0.75-0.8 mm long, glabrous, short-stipitate, the stipe 0.25 mm long, much shorter than the ovary; basal nectary 0.25-0.7 mm high. *Legume* 4-6 × 0.9-1.2 × 0.2 cm (immature), flat, straight; valves chartaceous, reticulate-veined, reddish brown, glabrescent, acute at apex; stipe 1.9 cm long; beak < 0.5 mm long. *Seeds* 3-6 per pod, not seen mature. Fig. 14.

Distribution. Central Mexico: Aguascalientes; Durango; Guerrero; Guanajuato; Jalisco; Morelos; Michocan; Zacatecas and Edo. Mexico. Fig. 15.

Habitat. Mainly in tropical deciduous forest, but often in grassland. 1500-2000 m.

Phenology. Flowering from July to October.

Taxonomic comments. Acaciella hartwegii is usually a prostrate perennial herb, less often becoming a more or less small erect shrub with a zig-zag branching pattern. *A. angustissima* var. *texensis* has zig-zag twigs, but the lower surface of the leaflets do not have a conspicuous brochidodromous venation. *A. hartwegii* was originally described as *Acacia hartwegi* by Benth., then McVaugh (1983) corrected the spelling of the epithet, but wrongly, cited the holotype as being at NY!.

Conservarion status. Based on known verified collections, the range of *Acaciella hartwegii* appears to be widespread across Mexico, but recent collections have only been from within the centre of the range. Surveys of the northerly populations are necessary to determine if these are still extant. Threats to this taxon include the expansion of urban areas and increasing goat herding. The observed collections do not present mature fruits; these may be eaten by livestock. A rating of Near Threatened (NT) is suggested.

Representative specimens

MEXICO. **Aguascalientes**: 21º 53' N, 102º 18' W, 1878 m, *Hartweg 74* (BM, G, K, NY, OXF); 30 km e of Aguascalientes, on

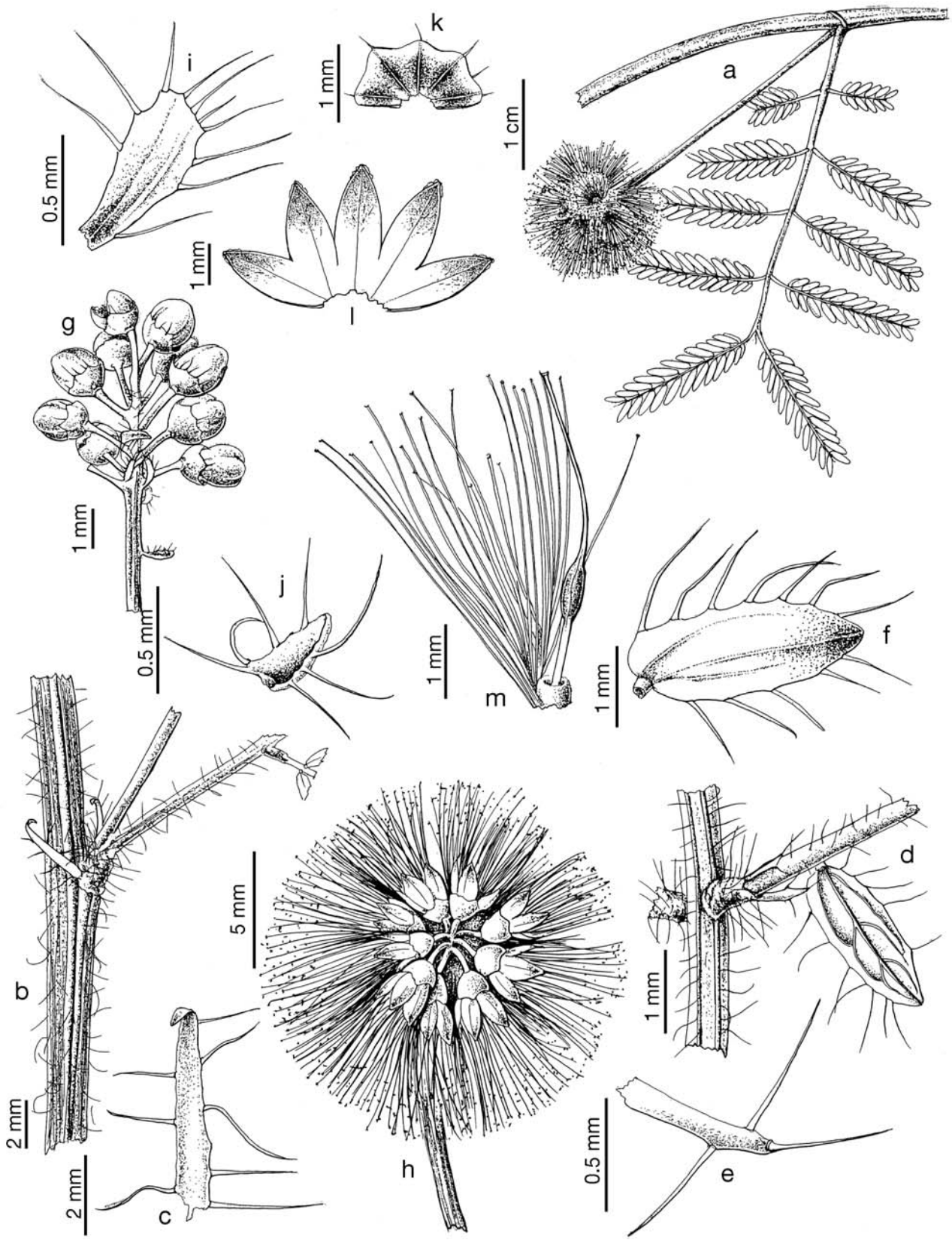

Fig. 14. *Acaciella hartwegii*: **a,** leaf and inflorescence; **b,** close up of base a leaf with stipules, fragment of petiole and peduncle; **c,** stipule; **d,** fragment of pinna showing basal paraphyllidia**,** pubescence and a leaflet undersurface; **e,** detail of a paraphyllidium; **f,** leaflet, upper surface; **g,** immature inflorescence with peduncular bract and floral bracts; **h**, mature inflorescence showing flowers and pedicels; **i**, peduncular bract; **j**, floral bract; **k**, calyx, opened out; **l**, corolla, opened out; **m**, androecium, many stamens have been removed, gynoecium and basal nectary. All from *Hinton 1423*. Drawn by H. Greenop.

road to Calvillo, 22º 00' N, 102º 30' W, 2200 m, 24-VIII-1960, *Rzedowski 14001* (MEXU). **Chihuahua**: Janos, Border of Chihuahua and Sonora, 30º 54' N, 108º 10' W, 1600 m, 26-VIII-1939, *White, S.S. 2584* (MEXU). **Durango**: 1.8 mi by highway 45 N (24 30 N, 104 40 W), 24º 30' N, 104º 40' W, 1900 m, 5-VII-1983, *Corral, R. 10815* (NY, TEX); Santiago Papasquiaro, Río de, Santiago Papasquiaro, 25º 11' N, 105º 26' W, 4-VIII-1996, *Palmer, E. 397* (MEXU, NY). **Guerrero**: Manchon Perlita, 1-IX-1936, *Hinton, G.B. 9418* (MEXU, NY); a 30 km al S de Olinala, camino a Tlapa, 17º 33' N, 98º 33' W, 2060 m, 27-VI-1982, *Martínez Esteban 1148* (BM, MEXU). **Jalisco**: Tepatitlán, Cerro, 3,9 km de Pegreros, por la carr. a Tepatitlán, 20º 46' N, 102º 25' W, 1850 m, 28-VII-1978, *Guzmán R., C. 1020* (IBUG, MEXU, NY); 12 km al N de Totatiche, 21º 53' N, 103º 27' W, 1800 m, 16-VIII-1983, *Hernández M., R. 9401* (K, MEXU); Between Huejuquilla & Mesquitec, 22º 36' N, 103º 52' W, 25-VIII-1997, *Rose, J. N. 2570* (NY). **México**: Villa Guerrero, Rancho Tobías near Villa Guerero, 18º 52' N, 99º 39' W, 22-VII-1945, *Alexander, E.J. 101* (NY); La Chorrera, Sierra, 25º 10' N, 100º 54' W, 1230 m, 8-VIII-1932, *Hinton, G.B. 1291* (MEXU, MO, NY); Zacualpan, 18º 43' N, 99º 47' W, 2100 m, 15-VIII-1970, *Matuda 38133* (MEXU). **Michoacán**: Revanador de Rivera, 1 km al N, 29-IX-1977, *Soto, J.C. 380* (MEXU). **Morelos**: Morelos, N de CIVAC, 18º 45' N, 99º 00' W, 1-IX-1976, *Huerta Valdés 18* (MEXU); 12 km al NW de Hiochiapam, 1200 m, 4-VIII-1950, *Human, Carl W. 67* (MEXU). **Oaxaca**: Mpio. San Juan Mixtepec, Lomas del Río Azucena, 3 km al SE de Pueblo Viejo, 17º 23' N, 97º 50' W, 1900 m, 21-VII-1989, *Reyes, J. 1700* (MEXU). **San Luis Potosí**: 17 mi. N of Cd. Valles, 22º 04' N, 99º 02' W, 330 m, 10-VII-1983, *Taylor, C.M. 1971* (ENCB). **Sinaloa:** entre Coyote y Palo Blanco, 25º 38' N, 108º 07' W,-X-1973, *González Medrano 6314* (MEXU). **Sonora:** Ures, 29º 26' N, 110º 24' W, 15-IV-1957, *Dudley, B.G. 745* (MEXU); Imuris, 30º 47' N, 110º 53' W, 4500 m, 22-VI-1977, *Dwyer, J.D. 14135* (MEXU). **Unknown**: *Ruiz & Pavon s.n.* (BM). **Zacatecas**: al S de Villanueva por la carr 54, desv al poblado Laguna del Carretero, 18-IX-1996, *Enríquez E.,D. 1212* (MEXU); Jalisco, near km 33 Ojuelos, Rd. 2 mi. NE of Paso de Troje, 23º 04' N, 102º 43' W, 2100 m, 25-VIII-1977, *McVaugh 16869* (MEXU, NY).

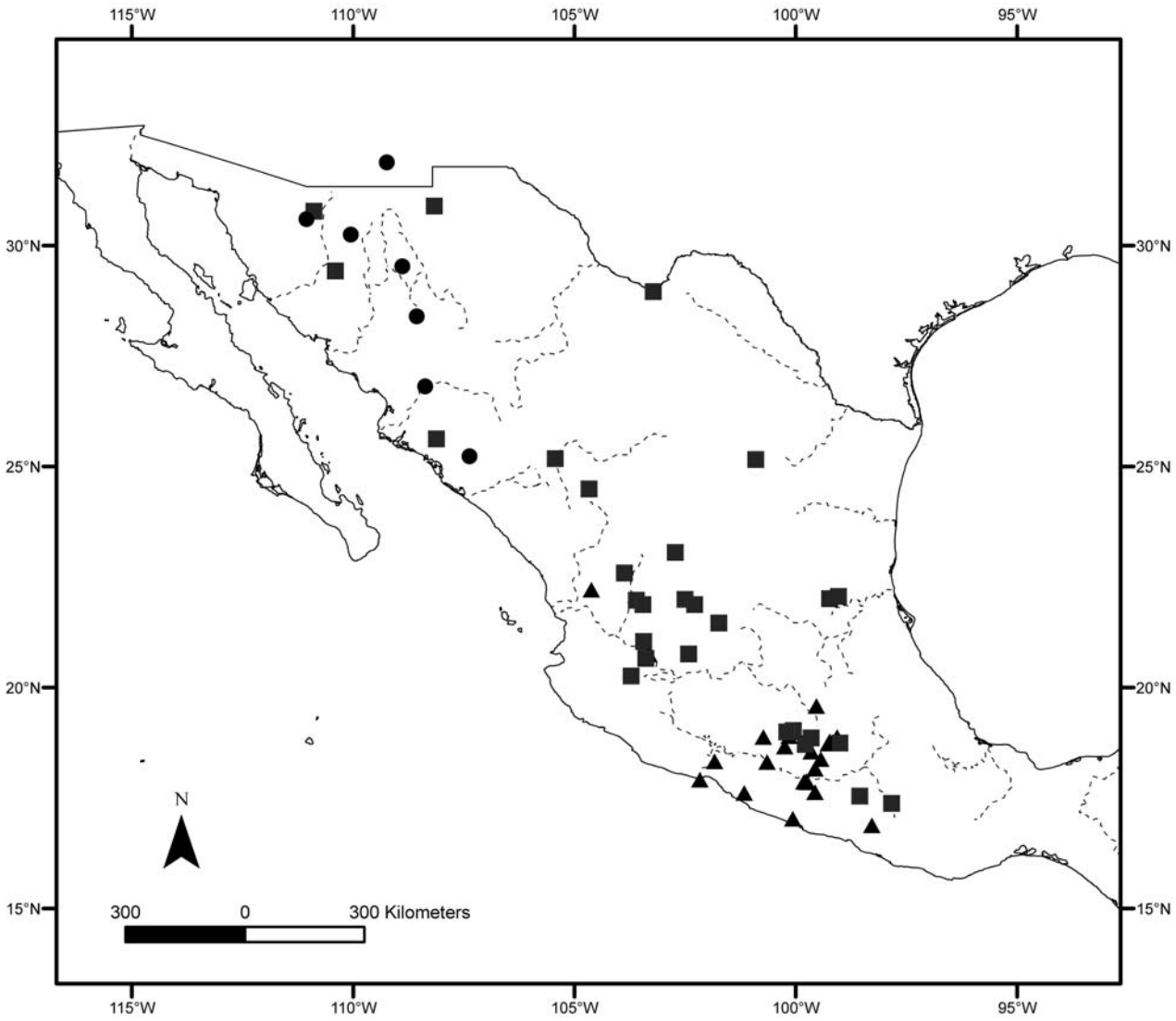

Fig. 15. Geographical range of *Acaciella hartwegii* (■), *A. igualensis* (▲) and *A. lemmonii* (●).

8. Acaciella igualensis Britton & Rose, N. Amer. Fl. 23: 102. 1928.

Acacia igualensis (Britton & Rose) Bullock, Bull. Mics. Inform. Kew 1939: 1. 1939.

Type: Mexico: Guerrero, near Iguala, 11 Aug. 1905, *Rose, Painter & Rose 9351* (holotype, NY!; isotypes, K!, US).

Acaciella holwayi Britton & Rose, N. Amer. Fl. 23: 103. 1928.

Type: Mexico: Morelos, Yautepec, *E. W. D. Holway 5237*, 24 Oct. 1903 (holotype, US-472612; isotype, NY!).

Shrub to 3 m tall, yellow-hirsute throughout. *Stipules* 4-5 × 1 mm long, fugacious. Leaves 10-16(22) cm long; petiole 1.5-2 cm long, cylindric, hirsute; rachis 5.5-12 cm long, hirsute, with 9-12 (15) pairs of pinnae; pinnae (2.2)4-7.5 cm long; paraphyllidia 0.5 mm long; leaflets (27)34-55 pairs per pinna, 3.5-5.5 × 1.5 mm, linear-oblong, base obliquely truncate, apex acute, venation brochidodromous, glabrous on both surfaces, margin long-ciliate, papyraceous. *Inflorescences* consisting of clusters of 2-4 capitulum-like racemes, on terminal axis to 12.5(32) cm long, yellow-hirsute; peduncles 0.8 cm long, sparsely hirsute, without pearl glands; inflorescence bracts two, one at the peduncle base, 1.2-2 mm long, linear, the other near the capitulum-like raceme, 1 mm long, broadly elliptic, pubescent on the margins, fugacious; floral bract 0.5 mm long, glabrous, broadly obovate, fugacious; pedicels 0.7-0.9 mm long, glabrous; flowers white, capitulum-like racemes 1-1.2 cm in diam. at anthesis. *Calyx* 0.5 mm long, 5-lobed, the lobes less than ¼ the length of the whole calyx, glabrous. *Corolla* to 2 mm long, 5-lobed, the lobes half the whole corolla length, glabrous. *Stamens* c. 4 mm long. *Ovary* 1 mm long, glabrous, short-stipitate, the stipe shorter than the ovary; basal nectary 0.5 mm high. *Legume* 5.5-6 × 0.9-1 × 0.2 cm, flat, straight, dehiscent along both sutures; valves chartaceous, conspicuously reticulate, glabrous, acute at the base and apex; stipe 0.5 cm long; beak present, 2 mm long. *Seeds* 8 per fruit, almost spherical, 3.5-4 × 4 × 1.5-2 mm. Fig. 16.

Distribution. Mexico central: Guerrero, Jalisco, Edo. Mexico, Michoacan, Morelos, Nayarit, and Puebla. Fig. 15.

Habitat. Most often found in *Quercus* forest, less frequent in low deciduous forest and savanna-like vegetation. Alt. 1100-1900 m.

Phenology. Flowering from August to October, fruiting from July to November.

Vernacular name. Timbre.

Taxonomic comments. *Acaciella igualensis* has stems with a very characteristic yellow-hirsute indumentum. It is very similar to *A. painteri* var. *houghii*, but can be distinguished by its shorter paraphyllidia, to 0.5 mm long (c. 1 mm long in *A. painteri* var. *houghii*). *A. igualensis* is also similar to *A. hartwegii*, but the latter species tends to be a prostrate perennial herb and its pubescence is white.

Conservarion status. Recent collections of *Acaciella igualensis* have shown that its distribution range is not as small as was previously thought; labels of recent collections mentioned that it is abundant in the areas where it was collected. This is species is rated as of Least Concern (LC).

Representative specimens

MEXICO. **Colima**: a 3 km al E de Los Asmales, 2-IX-1979, *Magallanes, J.A.S. 1814* (MEXU). **Guerrero**: 2 km al NW de Amatitlán, 17º 52'53'' N, 99º 46'09'' W, 1140 m, 14-IX-1994, *Calonico S., J. 1206* (MEXU); 2 km al SE de San Miguel, 1000 m, 5-IX-1996, *Cruz Durán, R. 944* (MEXU). **Jalisco**: Barranca de Huentitán, al comenzar el descenso, 20º 45' N, 103º 19' W, 8-IX-1988, *Reynoso, J.J. 154* (MEXU). **México**: Temascaltepec, 19º 02' N, 100º 03' W, 1450 m, 11-V-1932, *Hinton, G. B. 2500* (G, K); Calera, 19º 00' N, 100º 00' W, 7-IV-1935, *Hinton, G. B. 8016* (K, LL). **Michoacán**: Tiquicheo, 10 km al S de Tierra Caliente, 18º 53' N, 100º 44' W, 8-VII-1973, *González Medrano 6158* (MEXU); 10 km al NW de La Erendira, cerca de Paso de Nuñez, camino a Caracuaro, 23-IX-1977, *Soto, J.C. 322* (MEXU). **Morelos**: Alpuyeca, 18º 44' N, 99º 16' W, 3500 m, 17-VIII-1949, *Atmar, G.L. 70* (MEXU); Xochitepec, 18º 47' N, 99º 14' W, 1110 m, 1-XI-1923, *Lyonnet 1076* (MEXU). **Puebla**: Jolalpán, ranchería de Xochitepec, VII-1984, *Moreno Macías, E. 49* (MEXU).

9. Acaciella lemmonii (Rose) Britton & Rose, N. Amer. Fl. 23: 103. 1928 ["lemmoni"].

Acacia lemmoni Rose, Contr. U.S. Nat. Herb. 12: 409. 1909. *Acacia angustissima* subsp. *lemmonii* (Rose) Wiggins, Contr. Dudl. Herb. 3: 230. 1942.

Type: United States: Arizona, Huachuca Mountains, Sep. 1852, *J.G. Lemmon s.n.* (holotype, US-41089!; isotype, G!).

Acaciella shrevei Britton & Rose, N. Amer. Fl. 23: 105. 1928. *Acacia shrevei* (Britton & Rose) Tidestr., Proc. Biol. Soc. Wash. 48: 40. 1935. *Acacia angustissima* var. *shrevei* (Britton & Rose) Isely, Sida (6): 371. 1969. *Acacia hirta* var. *shrevei* (Britton & Rose) Kearney & Peebles, J. Wash. Acad. Sci. 29: 482. 1939.

Type: United States: Arizona, Huachuca Mountains, 26 Sep. 1916, *F. Shreve 5064* (holotype, NY!; isotype, US).

Shrub to 3 m tall; twigs hirsute-pubescent. *Stipules* lanceolate, 3-3.5 mm long, fugacious. *Leaves* 11-13.5 cm long; petiole 2.5-3.5 cm long, terete, hirsute-pubescent; rachis 6-9.5 cm long, hirsute-pubescent, with

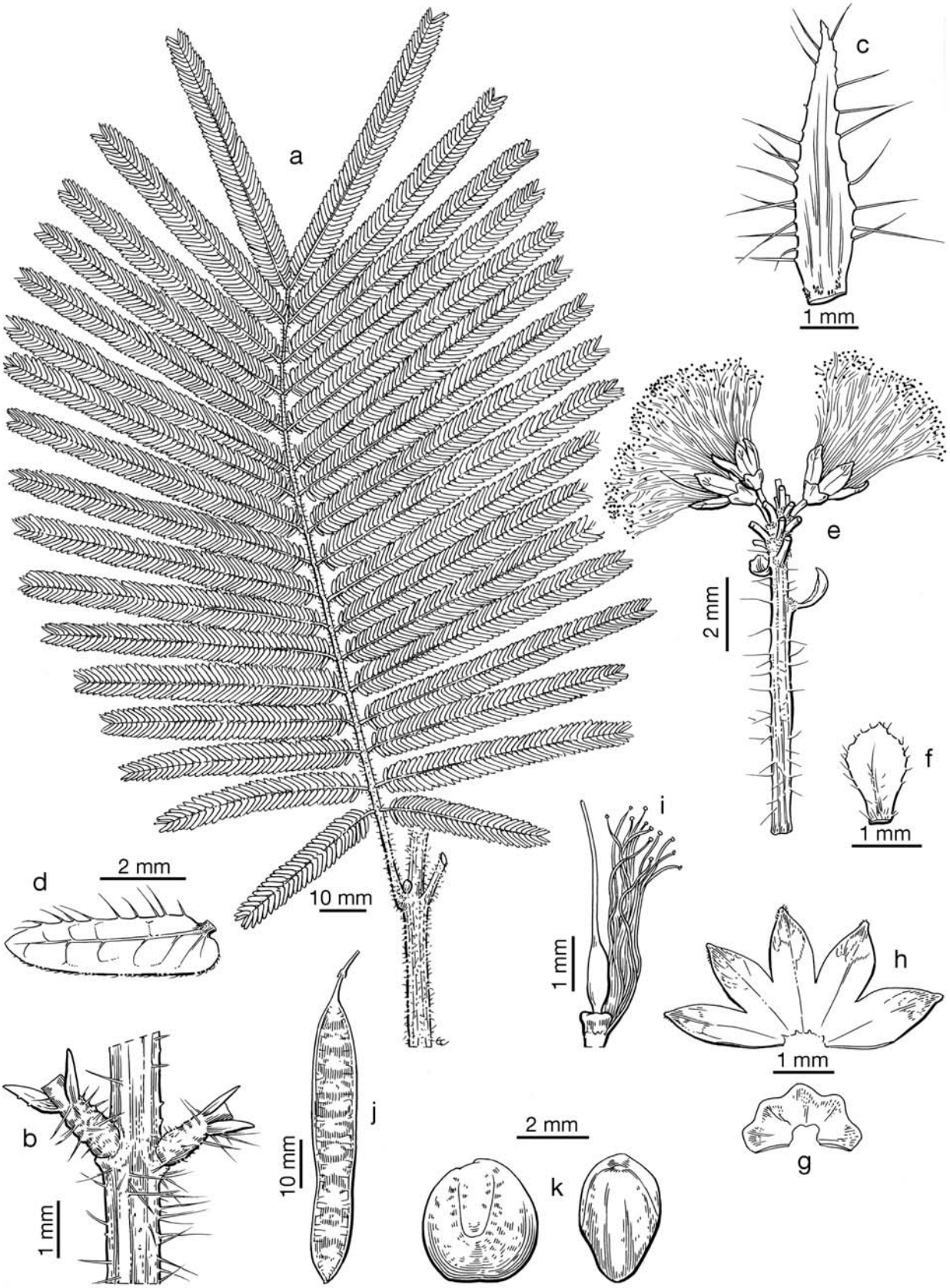

Fig. 16. *Acaciella igualensis*: **a,** bipinnate leaf; **b,** leaf fragment showing rachis, paraphyllidia on pinnae bases and pubescence; **c,** stipule**; d,** leaflet undersurface showing venation and ciliate margin; **e,** inflorescence fragment, some flowers have been removed; **f,** floral bract; **g,** calyx, opened out; **h,** corolla, opened out; **i,** androecium, many stamens have been removed, gynoecium and basal nectary; **j,** fruit, with beak broken; **k,** seed front view showing pleurogram, and profile view. a-d, j, k, from *Hinton & al. 5412;* e-h, from *Atmar 70;* i, from *Hinton & al. 8136*. Drawn by E. Catherine.

5-10 pairs of pinnae; pinnae 2-4 cm long; paraphyllidia 0.75-1 mm long; leaflets (15)18-20 pairs per pinna, 6-10 × 1.5 mm, oblong, base truncate, apex acute, venation inconspicuously brochidodromous, glabrous, margins sparsely and shortly ciliate, membranaceous. *Inflorescences* consisting of clusters of 2-3 axillary capitulum-like racemes; peduncles up to 1.2 cm long; hirsute-pubescent, whithout pearl glands; inflorescence bract one, near to the head, 1.5 mm long, glabrous, fugacious; floral bract less than 1 mm long, glabrous, clavate, fugacious; pedicels 0.5 mm long, glabrous; flowers white, becoming yellow-cream when dry, in capitulum-like racemes to 1.3 mm in diam. at anthesis. *Calyx* less than 0.5 mm long, 5-lobed, the lobes less than ¼ the length of the whole calyx, glabrous. *Corolla* 1.5 mm long, 5-lobed, the lobes to more than half the whole corolla length, glabrous. *Stamens* 6 mm long. *Ovary* 1 mm long, glabrous, short-stipitate, the stipe shorter than the ovary; basal nectary 0.5-0.7 mm high. *Legume* 4-6 × 0.8-1 × 0.2-0.3 cm, flat, straight; valves chartaceous, conspicuously reticulate-veined, hirsute, with hairs becoming sparser when fruit mature, rounded at the base, acute at the apex; stipe up to 1.2 cm long; beak absent. *Seeds* (6)8-10(12) per fruit, almost spherical, 4.5 × 3.5-4 × 2 mm. Fig. 17.

Distribution. Southern United States: Arizona and Texas; Mexico north: Chihuahua, Nuevo Leon, Sinaloa and Sonora. Fig. 15.

Habitat. Dry scrub. Alt. 900-1600 m.

Phenology. Flowering May to September, fruiting from June to October.

Taxonomic comments. Acaciella lemmonii is easily recognised by its leaflets drying yellowish-green, with a fine brochidodromous venation, and the hirsute young twigs. Is is similar to *Acaciella hartwegii* which is usually a prostrate perennial pilose herb with a very conspicuous brochidodromous leaflet venation.

Conservarion status. The range of *Acaciella lemmonii* appears to be restricted to the north Mexican states of Sonora, Sinaloa and Chihuahua and also Arizona and Texas in the Unites States. The desert scrub in the Mexican part of this distribution is thought to be under threat from increased cultivation of buffel grass for livestock. Estimates suggest that Sonoran Desert scrub may have decreased by as much as 31% between 1973 and 1992 (Carton & al. 2005). However, as this species also occurs at slightly higher elevations it may not be immediately affected by the loss of habitat. Therefore a rating of Near Threatened (NT) is advised because it may become threatened under criterion A if habitat loss continues.

Representative specimens

MEXICO. **Nuevo León**: 24 km al S de Linares, 1400 m, 25-IX-1986, *Estrada, A.E. 683* (MEXU). **Sinaloa**: Arroyo, Potrerillo, 25º 14' N, 107º 22' W, 1100 m, 24-VI-1982, *Hernández M., R. 7406* (IBUG, MEXU); 9 km, al E de Agua Caliente, 26º 49' N, 108º 22' W, 600 m, 6-X-1985, *Tenorio, P. 10259* (MEXU). **Sonora**: Los Pozos drainage S into Rio, 29º 32' N, 108º 53' W, 1000 m, 25-IX-1991, *Joyal, E. 1765* (TEX); Concordia, 3 km al NE de Loberas, 30º 36' N, 111º 03' W, 1922 m, 26-VI-1982, *Tenorio, P. 611* (IBUG, MEXU); Janos, Border of Chihuahua and Sonora, 30º 15' N, 110º 03' W, 1600 m, 26-VIII-1939, *White, S.S. 2555* (MEXU). USA. **Arizona**: Deer Canyon, 31º 53' N, 109º 14' W, 600 m, 2-IX-1906, *Blumer, J.C. 1236* (K, MEXU); 21 miles from junction of highway 81-83, along highway 83, 1-V-1949, *Tharp 52-145* (MEXU).

10. Acaciella painteri Britton & Rose, N. Amer. Fl. 23: 102. 1928.

Acacia painteri (Britton & Rose) L. Rico, Anales Jard. Bot. Madrid 58: 281. 2001.

Type: Mexico: Jalisco, near Guadalajara, 28 Sept. 1903, *J.N. Rose* & *J.H. Painter 7388* (holotype, US!; isotype, NY!).

Detailed observation of the types of *Acaciella houghii*, *A. submontana* and *A. painteri* together with numerous collections from several states (Jalisco, Morelos, Nayarit, Guerrero, Edo. Mexico, Michoacan) show that all belong to the same species wich contains two discrete groups. *A. houghii* represents one extreme, being almost glabrous, having fewest pinnae and the largest leaflets. *A. painteri* lies at the other extreme, it is the most pubescent, with numerous pairs of pinnae, and the smallest leaflets with very long-cilia. The type material of *Acacia submontana* fits well into *A. houghii* and represents the extreme of sparsely puberulous plants. The leaves closest to the reproductive structures have the fewest pinnae and bigger leaflets. Young twigs are extremely pubescent, leaflets often have a tuft of pilose hairs on the upper surface next to the main vein. Plants with the most variable leaflet characters are found in Morelos State. The most pubescent plants are found in Nayarit and Jalisco. The species is treated here as cointaining two varieties; both are closely related to *Acaciella igualensis* which shares a geographical distribution with *Acaciella painteri* var. *houghii*.

KEY TO VARIETIES OF *ACACIELLA PAINTERI*

1. Twigs, rachises and petioles with short, sparse strigulose hairs, sometimes hirsute, but not yellow-hirsute; restricted to Jalisco and Nayarit states in SW Mexico .. **10a.** var. **painteri**
1. Twigs glabrous or very sparsely puberulous; plants with a wider distribution in Central and Southwest Mexico .... **10b.** var. **houghii**

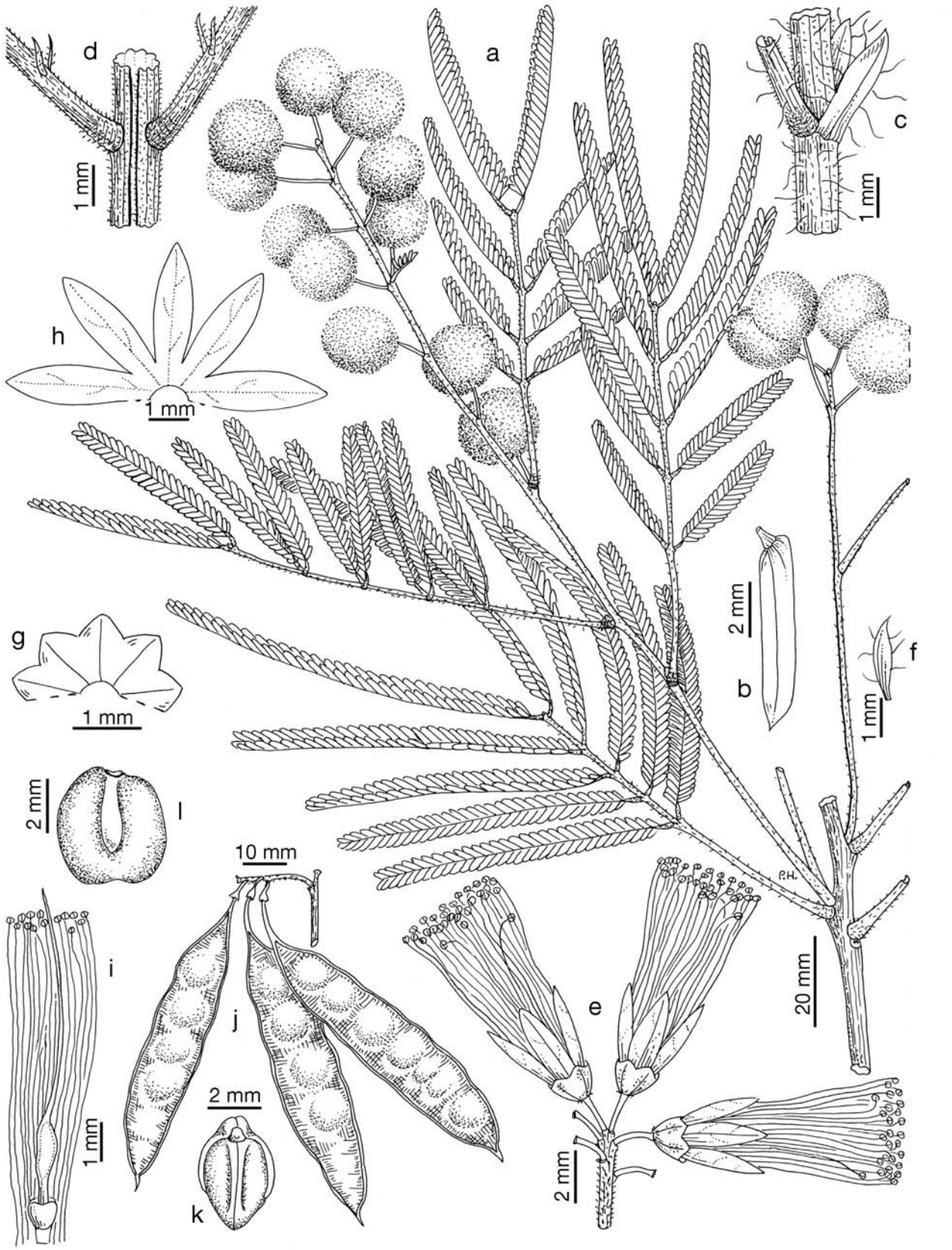

Fig. 17. *Acaciella lemmonii*: **a,** habit and inflorescence; **b,** leaflet above surface; **c,** stem fragment, base of petiole and stipules; **d,** leaf fragment showing channelled rachis and paraphyllidia on pinnae bases; **e,** inflorescence fragment; **f,** floral bract; **g,** calyx, opened out; **h,** corolla, opened out; **i,** androecium, many stamens have been removed, gynoecium and basal nectary; **j,** fragment of infrutescence; **k,** seed, profile view showing protuberant pleurogram area; **l,** seed, front view showing pleurogram. a-b, d-i, from *Tenorio & al. 611;* c, from *Blumer 1236;* j-l, from *Hernández* & *Tenorio 7406*.

10a. Acaciella painteri Britton & Rose var. **painteri**

Shrub to 5 m tall, densely white-pubescent on the very young stems. *Stipules* fugacious, not seen. *Leaves* 5-15(18) cm long; petiole 2-4.5 cm long, slightly channelled, usually pubescent; rachis 1-3 cm long, glabrescent to shortly adpressed-hairy; with 3-9 pairs of pinnae; pinnae 4-5.5(8) cm long; with paraphyllidia c. 1 mm long; leaflets (25)34-40(58) pairs per pinna, 4.5-7 (12) × 1.2-1.5(3) mm, linear-oblong, chartaceous, base oblique, apex rounded-acute, venation brochidodromous, with a very sunken venation on the undersurface, usually glabrous, sometimes slightly pubescent along the base of the midvein, margins very short-ciliate. *Inflorescences* consisting of axillary and terminal racemes, main rachis 8.5-25 cm long, densely white-pubescent; peduncle 0.7-1 cm long; glabrous or glabrescent, without pearl glands; with 1-2 bracts, the first 2 mm long, at the peduncle base, the second 1 mm long on the middle of the peduncle, sometimes pubescent, linear, fugacious; floral bract 0.5 mm long, pubescent, clavate, fugacious; pedicels 0.7-1 mm long, glabrous; flowers white, dark orange when dry; in short capitulum-like racemes 0.7-12 mm in diam. at anthesis. *Calyx* 1 mm long, 5-lobed, the lobes less than ¼ the length of the whole calyx, glabrous. *Corolla* 2.3-2.5 mm long, 5-lobed, the lobes to more than half the whole corolla length, glabrous. *Stamens* 4.5 mm long. *Ovary* 1.2 mm long, glabrous, short-stipitate, the stipe shorter than the ovary; basal nectary 0.3-0.4 mm high. *Legume* (3.7)4(5) × 0.7-0.9 × 0.2-0.3 cm, flat, straight, dehiscent; valves membranaceous, conspicuously reticulate, sparsely white-pubescent, acute at the base and apex; stipe 0.6-1.5 cm long; beak present, 2 mm long. *Seeds* 8 per fruit, spherical, circular in outline, 3.5-4.5 × 3.5-4.5 × 1.5-2 mm. Fig. 18.

Distribution. Mexico central: Guerrero, Jalisco, Edo. Mexico, Michoacan, Nayarit and Zacatecas states. Fig. 19.

Habitat. Dry scrubland and low deciduous forest, less frequent in *Quercus* and mixed *Pinus-Quercus* forest. Alt. 50-1750 m.

Phenology. Flowering from August to October, fruiting August to November.

Taxonomic comments. Acaciella painteri var. *painteri* has leaflets with a very sunken brochidodromous venation, this visible only on the leaflet undersurface; the peduncles and young branches are white-pubescent. It is not so widely distributed as *A. painteri* var. *houghii*.

Conservarion status. The range of *Acaciella painteri* var. *painteri* is restricted to the south western region of Mexico, but is not small enough to meet the area threshold under criterion B. Information from herbarium labels indicates that the distribution may be patchy so the AOO may be small. General threats in this region include conversion of habitat for agricultural use and loss of habitat due to expansion of human settlements. A rating under criterion A may be appropriate, however due to the uncertainty of the relationship between habitat loss and population size (i.e. lack of quantitative data) a rating of Near Threatened (NT) is advised.

Representative specimens

MEXICO. **Jalisco**: Puente San Pedro, 5 m SW of Tecatitlan, 1200 m, 22-IX-1958, *McVaugh 18094* (MEXU); 3 m S of la Huerta, road to Barra de Navidad, 500 m, 3-X-1960, *McVaugh 19797* (MEXU); Cerro del Palacio, 4-5 km al WSW de Tuxcacuesco, 19º 40'27'' N, 104º 00'46'' W, 1100 m, 21-X-1996, *Santana, F.J. 7876* (MEXU). **México**: El Zapote, Carr. Tejupilco-Bejucos, 1000 m, 20-X-1978, *Guizar N., E. 239* (MEXU). **Michoacán**: San José Purúa, 3-X-1964, *González Q., L. 1728* (MEXU); Coalcomán, 18º 47' N, 103º 09' W, 1000 m, 24-X-1938, *Hinton, G.B. 12453* (K); 2 km S of Ario de Rosales, 19º 11'60'' N, 101º 43' W, 1824 m, 31-XII-1977, *Soto, J.C. 575* (MEXU). **Nayarit**: 1.5 m W of Mazatlan on road to Las Varas, 600 m, 27-VIII-1959, *Feddema, C. 1062* (MEXU); 10 km al E de El Venado o a 1 km al E de Real del Zopilote, camino a San Miguel Zapote, 10-IX-1985, *Téllez, O. 9196* (MEXU). **Zacatecas**: km 85 carr. Zacatecas-Guadalajara, 8-X-1992, *Enríquez E., D. 275* (MEXU).

10b. Acaciella painteri var. **houghii** (Britton & Rose) L. Rico**, comb. nov.**

Acaciella houghii Britton & Rose, N. Amer. Fl. 23: 103. 1928. basion.

Type: Mexico: Morelos, near Cuernavaca [18º 55'N, 99º 15'W], *J.N. Rose* & *Walter Hough 4367* (holotype, NY!; isotype, US!).

Acaciella submontana Britton & Rose, N. Amer. Fl. 23: 103. 1928.

Type: Mexico: Nayarit, Mpio. Tepic, near San Blasito [20º 40'N, 104º 16'W], 4 Aug. 1897, *J.N. Rose 3345* (holotype, NY!; isotype, US).

Shrub to 5 m tall, glabrous, occasionally pubescent on very young stems. *Stipules* linear to lanceolate, 3-3.5(4) mm long, with long erect hairs, fugacious. *Leaves* 8.5-10(12) cm long; petiole 2-2.5 cm long, slightly channelled, glabrous or glabrescent; rachis 1-3 cm long, glabrescent, with 3-8 pairs of pinnae; pinnae 4-5.5 cm long; paraphyllidia c. 1 mm long; leaflets (16)34-40 pairs per pinna, 4.5-7(12) × 1.5-2(3) mm, linear-oblong, base oblique, apex rounded to acute, venation brochidodromous, usually glabrous, sometimes slightly pubescent on the base of the midvein, margin very short-ciliate, membranaceous. *Inflorescences* consisting of clusters 2-3, racemes axillary or terminal, usually on a main axis 8.5-20 cm long,

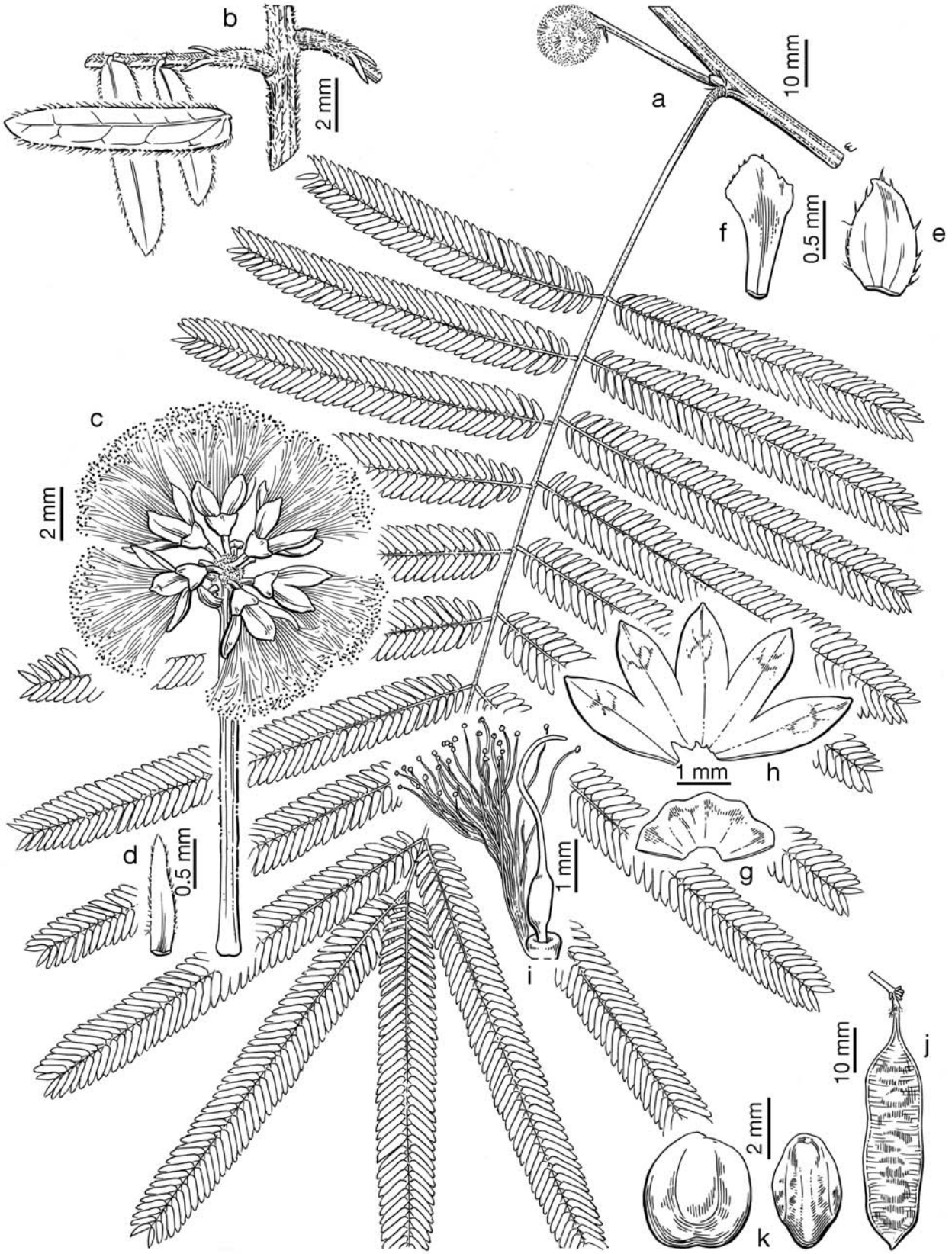

Fig. 18. *Acacia painteri* var. *painteri*: **a,** leaf and an axillary inflorescence; **b,** leaf fragment showing rachis, paraphyllidia on pinnae bases, with two upperside and one underside leaflets; **c,** detail of a peduncle with few flowers; **d**, bract from the peduncle base; **e,** bract from the peduncle apex, close to the flowers; **f,** floral bract; **g,** calyx, opened out; **h,** corolla, opened out; **i,** androecium, many stamens have been removed, gynoecium and and basal nectary; **j,** fruit; **k,** seed front and profile view. a, c-i, from *Hinton 12453*, b, j, k, from *Rico* & *Martínez 880*. Drawn by E. Catherine.

glabrescent; peduncles 0.7-1 cm long; glabrous or glabrescent, without pearl glands; inflorescence bracts 1 or 2, up to 2 mm long, one at the middle of the peduncle, the other very near to the raceme, pubescent, linear, fugacious; floral bract 0.5 mm long, pubescent, clavate, fugacious; pedicels 0.7-1 mm long, glabrous; flowers white, becoming orange when dry; racemes 0.7-1(2.2) cm long at anthesis. *Legume* (3.7)4 × 0.7 × 0.2 cm, flat, straight, dehiscent; valves membranaceous, conspicuously reticulate, glabrous, acute at the base and apex; stipe 0.6 mm long; beak present, 2 mm long. *Seeds* 3-3.5 × 3-3.3 × 2.1-2.3 mm. Fig. 20.

Distribution. Mexico: Chiapas, Colima, Durango, Guerrero, Jalisco, Edo. Mexico, Michoacan, Morelos, Nayarit, Puebla, Sinaloa and Sonora. Fig. 19.

Habitat. Seasonally dry forest, dry scrubland, scrub, *Quercus* and mixed *Quercus-Pine* forest and less frequently in humid mesophyllous forest; on sandy soils, but prefers limestone. Alt. 50-1950 m.

Phenology. Flowering all year, fruiting from August-March.

Taxonomic comments. Acaciella painteri var. *houghii* usually presents capitulum-like racemes of 1.5 cm diam., although several collections, as illustrated in Fig. 20, have elongate racemes to 2.2 cm long. Within *Acaciella* species, this variety has the most pronounced brochidodromous leaflet venation.

Conservarion status. Acaciella painteri var. *houghii* is widely distributed and current collections indicate that it is abundant in its distribution range. A rating of Least Concern (LC) is given.

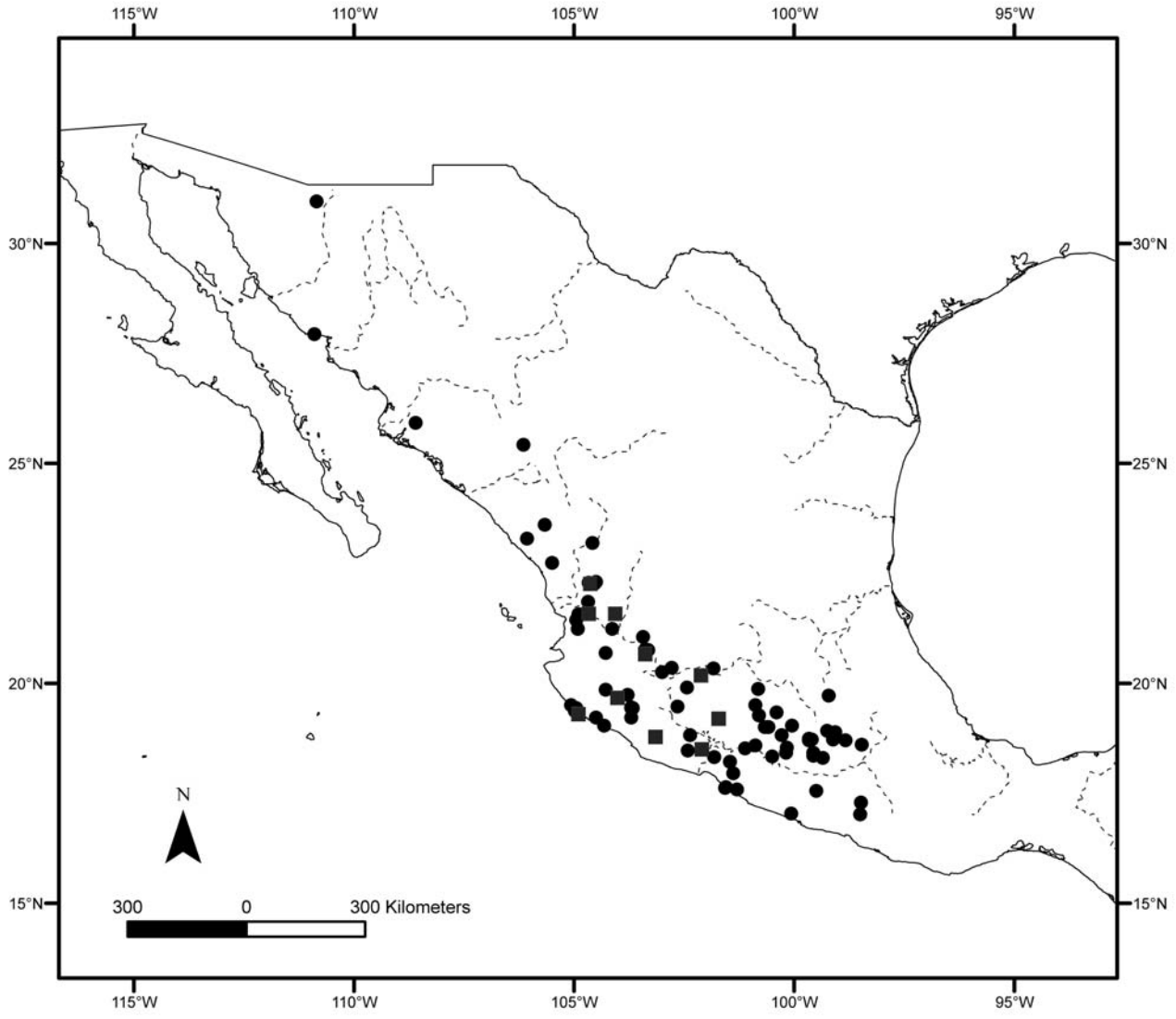

Fig. 19. Geographical range of *Acaciella painteri* var. *painteri* (■) and *A. painteri* var. *houghii* (●).

Fig. 20. *Acacia painteri* var. *houghii*. **a,** habit and inflorescence; **b,** whole leaf; **c,** a pinna; **d,** fragment of pinna showing basal paraphyllidia; **e,** middle peduncle bract; **f,** racemose elongation of inflorescense and associated floral bracts; **g,** seed in profile view showing micropile; **h,** seed in front view showing pleurogram; **i,** gynoecium and basal nectary; **j,** corolla, opened out; **k,** calyx, opened out; **l,** fruit. a, from *Catalán 275*; b, d, from *Flores 612*; c, from *Catalán 465*; e-f, i-k, from *Martínez E. 411*; g-h, l, from *Hinton 8856*. Drawn by E. Papadopoulos.

Representative specimens

MEXICO. **Colima**: Manzanillo, 19º 02' N, 104º 19' W, 26-XI-1981, *Magallanes, J.A.S. 3329* (MEXU); Steep bluffs above Rio Salado, 5 miles S of Colima, 19º 13' N, 103º 42' W, 400 m, 17-VII-1957, *McVaugh 15505* (MEXU); Rancho el Jabali, approx. 20 km N de la Cd. de Colima, cerca de la Hacienda San Antonio, 19º 26' N, 103º 40' W, 1300 m, 7-II-1992, *Rico, L. 949* (K, MEXU). **Durango**: cañón río Mezquital, Camino entre Temoaya y La Candelaria, 23º 11' 09'' N, 104º 35' W, 1100 m, 6-X-1999, *González, M. 3146* (CIIDIR, K). **Guerrero**: Potreritos, 3,7 km al E, 18º 12' 45'' N, 101º 27'37'' W, 1240 m, 29-I-2000, *Calonico S., J. 20926* (MEXU); 3 km adelante del poblado de Alcozauca, 1310 m, 4-XII-1989, *Calzada, J.I. 15111* (MEXU). **Jalisco**: Bolaños, En la Zuluaga, 8 km al W de San Martín Bolaños, 21º 14' N, 104º 08' W, 1500 m, 21-VIII-1988, *Flores M., A. 1076* (IBUG, MEXU); Huentitán Bajo, Barranca de Huentitán, 20º 45' N, 103º 19' W, 1300 m, 3-XI-1990, *Flores M., A. 2525* (XAL); Rancho Cuixmala, Saddle on road between Cumbres 1 and Cumbres 2, 19º 26' N, 104º 58' W, 20-VIII-1991, *Lott, E.J. 3814* (K, MEXU); La Flor del Campo, Mpio. de Mazanitla, 2000 m,-VIII-1978, *Pérez Calix, E. 28* (IEB). **México**. Temascaltepec, La Chorrera, 19º 02' N, 100º 03' W, 1350 m, 20-XII-1933, *Hinton, G. B. 5367* (K); Limones, 18º 49' N, 100º 17' W, 960 m, 22-XII-1933, *Hinton, G. B. 5377* (K, LL). **Michoacán**: a 12 km SW de Tuzantla por carr. a Tiquicheo, entre Puente el Pedregal y Las Juntas, 19º 00' N, 100º 40' W, 600 m, 20-VII-1983, *Hernández H.M. 173* (MO); 13 km al S de Arteaga y a 13 km N de Taguazal, 18º 28' N, 102º 25' W, 23-X-1977, *Ladd M. 324* (MEXU); 5 km al SW de Ario de Rosales, 19º 12' N, 101º 43' W, 1650 m, 11-IX-1979, *Soto, J.C. 1540* (MEXU). **Morelos**: Carr. Cuernavaca-Yautepec " Cañón de Lobos", 18º 53' N, 99º 04' W, 1420 m, 2-XII-1982, *Dorado, O. 1089* (K, MEXU); 2 km al S de Tlayca, Mpio. Jonacatepec, 18º 42' N, 98º 50' W, 1300 m, 18-X-1986, *Flores F., G. 289* (MEXU). **Nayarit**: 2,8 km al NW de Jesús María, camino a Mesa del Nayar, 22º 15' N, 104º 33' W, 970 m, 23-IX-1989, *Flores F., G. 1279* (MEXU). **Puebla**: Izúcar de Matamoros, 18º 36' N, 98º 28' W, 5-IX-1966, *Boege, W. 346* (MEXU); Paraje Las Trojas, 5 km de El Sábalo, 1200 m, 1-XI- 1985, *Vidana, J.M. 60* (IBUG, IEB). **Sinaloa**: La Cebolla ± 40 km al N de San Ignacio, 25º 25' N, 106º 09' W, 1500 m, 20-VIII-1980, *Avina, R.V. 826* (MEXU); On the road from Esquinapa de Hidalgo to Acaponeta on the first rise of small hills 10 km to the south of Esquinapa, 22º 44' N, 105º 30' W, 10 m, 15-XI- 1991, *Macqueen, D.J. 222* (EAP, FHO, K, MEXU). **Sonora**: Guaymas, 27º 56' N, 110º 54' W, 11-X-1887, *Palmer, E. 254* (BM); Cañada Verde, 19 km al E de Agua Caliente, 30º 57' N, 110º 51' W, 1050 m, 6-X-1985, *Tenorio, P. 10243* (MEXU, TEX). **Zacatecas**. Santa Rosa, Cerro de la Cruz, Cañón de Juchipila, 5-VIII-1992, *Enríquez E., E. 91* (MEXU).

11. Acaciella rosei (Standl.) Britton & Rose, N. Amer. Fl. 23: 105. 1928.

Acacia rosei Standl., Contr. U.S. Natl. Herb. 20: 187. 1919.

Type: Mexico: Sinaloa, Mazatlán vicinity, 30-III-1910, *Rose, Standley & Russell 13673* (holotype, US!; isotype, NY!).

Acaciella ortegae Britton & Rose, N. Amer. Fl. 23: 106. 1928.

Type: Mexico: Sinaloa, Mazatlán, *J. González Ortega 6501* (holotype, US!; isotypes, K!, MEXU!, NY!).

Acacia mazatlana M.E. Jones, Contr. West. Bot. 15: 141. 1929.

Type: Mexico: Sinaloa; Mazatlán, *M.E. Jones 22430* (holotype, POM; isotype, GH!).

Shrub to 5 m tall, sparsely hirtellous-pilose. *Stipules* 2-2.5 mm long, c. 1 mm wide, pubescent, fugacious. *Leaves* 15 cm long; petiole 2.4(3) cm long, glabrous; rachis 2-3 cm long, glabrous, with 1-2 pairs of pinnae; pinnae 3.5-7.5 cm long; paraphyllidia 2.5 mm long, fugacious; leaflets 2-3(4) pairs per pinna, 3-6.5 × (0.9)1.2-3 cm, elliptic to widely elliptic, base and apex acute, brochidodromous venation well marked on both surfaces, glabrous above, sparsely pubescent only along the veins on the under surface, coriaceous. *Inflorescence* comprising clusters of 2-3 racemes in terminal panicles, less frequently axillary, main rachis 7-16 cm long, slightly hirsute; peduncles 0.8-1.8 cm long; glabrous or nearly so, without pearl glands; 2 inflorescence bracts on the peduncle, one near the base, 5 mm long, linear-triangular, pubescent, fugacious, another higher up the peduncle close to the raceme, 0.75 mm long, lanceolate, usually glabrous or with only a very few pilose hairs; floral bract 0.7 mm long, slightly hirtellous, clavate, fugacious, very conspicuous when the inflorescence is immature; pedicels 0.8-1mm long, glabrous; flowers white, in short capitulum-like racemes 12-14 mm in diam. at anthesis. *Calyx* 0.5 mm long, the lobes 5-lobed, less than ¼ the length of the whole calyx, calyx almost truncate, almost glabrous. *Corolla* 2.2 mm long, 5-lobed, the lobes to more than half the whole corolla length, glabrous. *Stamens* 4-5 mm long. *Ovary* 1.5 mm long, glabrous, short-stipitate, the stipe shorter than the ovary; basal nectary 0.25 mm high. *Legume* 5-5.8 × 1.4 × 0.2-0.25 cm, flat, straight, dehiscent; valves chartaceous, conspicuously reticulate, glabrous, acute at the base and apex; stipe 1.3 cm long; beak to 3 mm long. *Seeds* 8 per fruit. Fig. 21.

Distribution. Mexico north and central: Colima, Jalisco, Sinaloa and Sonora. Fig. 22.

Habitat. Seasonally dry forest; often in association with *Bursera*; on limestone and clay-loam soil. Alt. 0-600 m.

Phenology. Flowering August to March, fruiting October to March.

Taxonomic comments. Acaciella rosei is a very handsome shrub having the largest leaflets in the genus. It has great ornamental potential. The morphology of the species is unique and no similarities with other known *Acaciella* specie are found except with of *A. sotoi* which differs in being densely pubescent and endemic to one known locality in Michoacan.

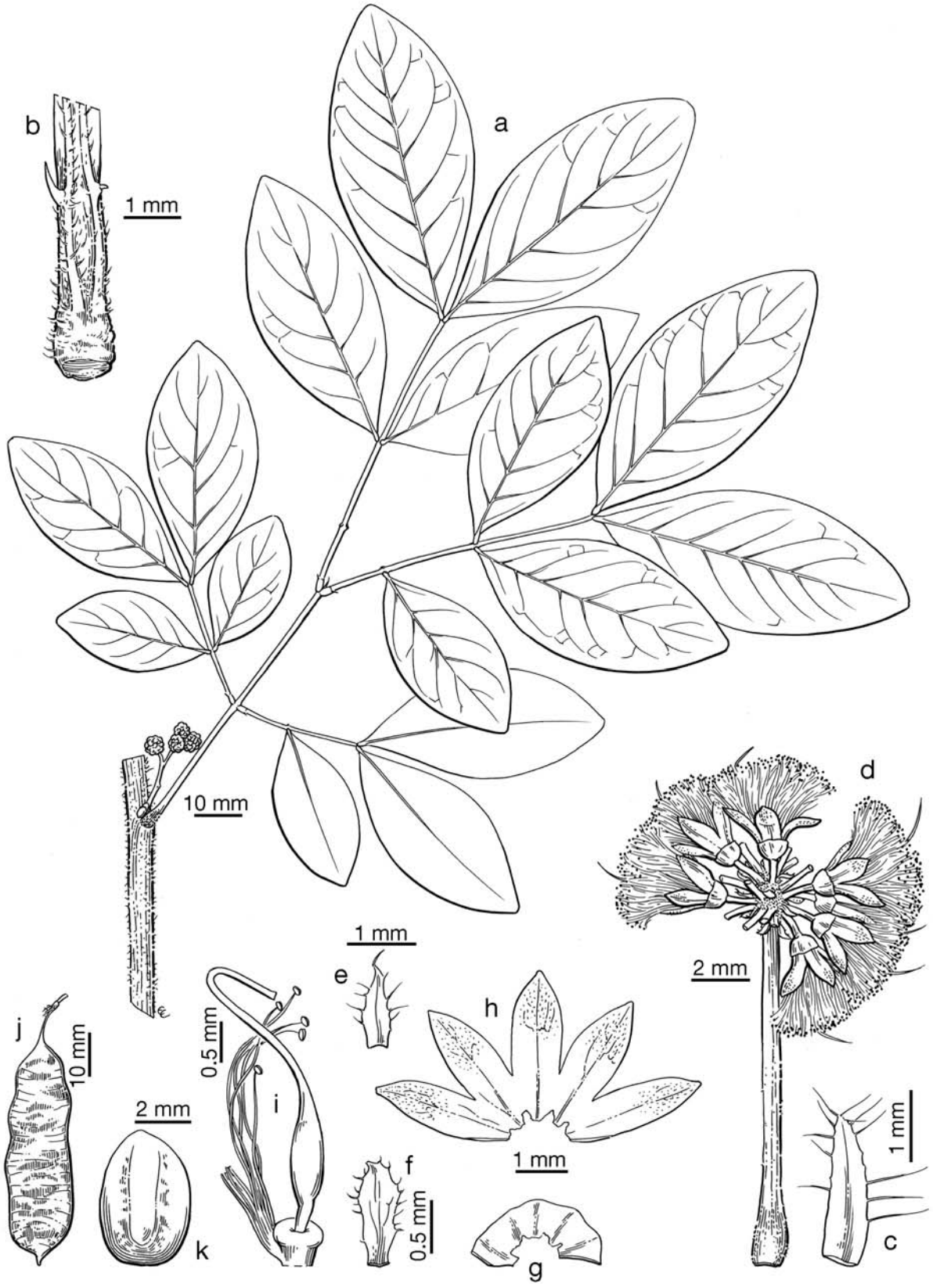

Fig. 21. *Acacia rosei*: **a,** a leaf and part of stem; **b,** base of pinna showing paraphyllidia and channelled stem; **c,** inflorescence bract; **d,** inflorescence fragment and peduncle; **e,** peduncular bract; **f,** floral bract; **g,** calyx, opened out; **h,** corolla, opened out; **i,** gynoecium, androecium, with many stamens removed and basal nectary; **j,** fruit; **k,** seed. a, c-k, from *Lott & al. 4152*; b, from *Rico & Contreras 1035*. Drawn by E. Catherine.

Conservarion status. Acaciella rosei is restricted to the western Mexican coast. The seasonally dry forest in which this species is found is under increasing threat from residential construction and town expansion. However, the threats are not considered significant enough to warrant a threatened category, so this species is currently rated as of Least Concern (LC).

Representative specimens

MEXICO. **Colima**: Vicinity of Manzanillo, 19º 02' N, 104º 19' W, 28-XI-1925, *Ferris, Roxana 6085* (NY); 10 m SE of Colima, 400 m, 5-XII-1959, *McVaugh 1461* (MEXU); 19º 03' N, 104º 17' W, 94 m, 21-X-1910, *Orcutt, C.R. 4460* (MEXU). **Jalisco**: Arroyo Cuixmala, Cumbres 1, 19º 31' N, 104º 56' W, 300 m, 5-XI-1991, *Lott, E.J. 4152* (K, MCS, MEXU); 25 km NW of Río San Nicolás and 20 SE of Tomatlán, 19º 50' N, 105º 23' W, 10-XII-1970, *McVaugh 25295* (MEXU, NY). **Sinaloa**: NE de Huajote, 25º 31' N, 107º 37', 250 m, 9-X-1992, *González E., A. s.n.* (MEXU); La Bajada, 25º 55' N, 109º 00' W, 300 m,-XI- 1922, *González Ortega, J. 554* (MEXU); Mazatlán, 23º 13' N, 106º 25' W, III-1931, *González Ortega, J. 6740* (G, MEXU, MO).

12. Acaciella sotoi L. Rico, **sp. nov.**

Type: Mexico: Michoacán; Mun. Aquila, 7 km NO de la Placita, 20 Oct. 1985, *J.C. Soto 11203* (holotype, MEXU!; isotypes, BM!, K!, MO!).

Speciei A. rosei (Standl.) Britton & Rose *proxima, a qua differt stipulis multo grandioribus, petiolo hirtello, paraphyllidiis minoribus, foliolis in unaquaque pinna magis numerosis, ovato-rhombicis, supra puberulis, subtus dense sericeis, calyce longiore, sericeo, corolla sericea et legumine dense villoso.*

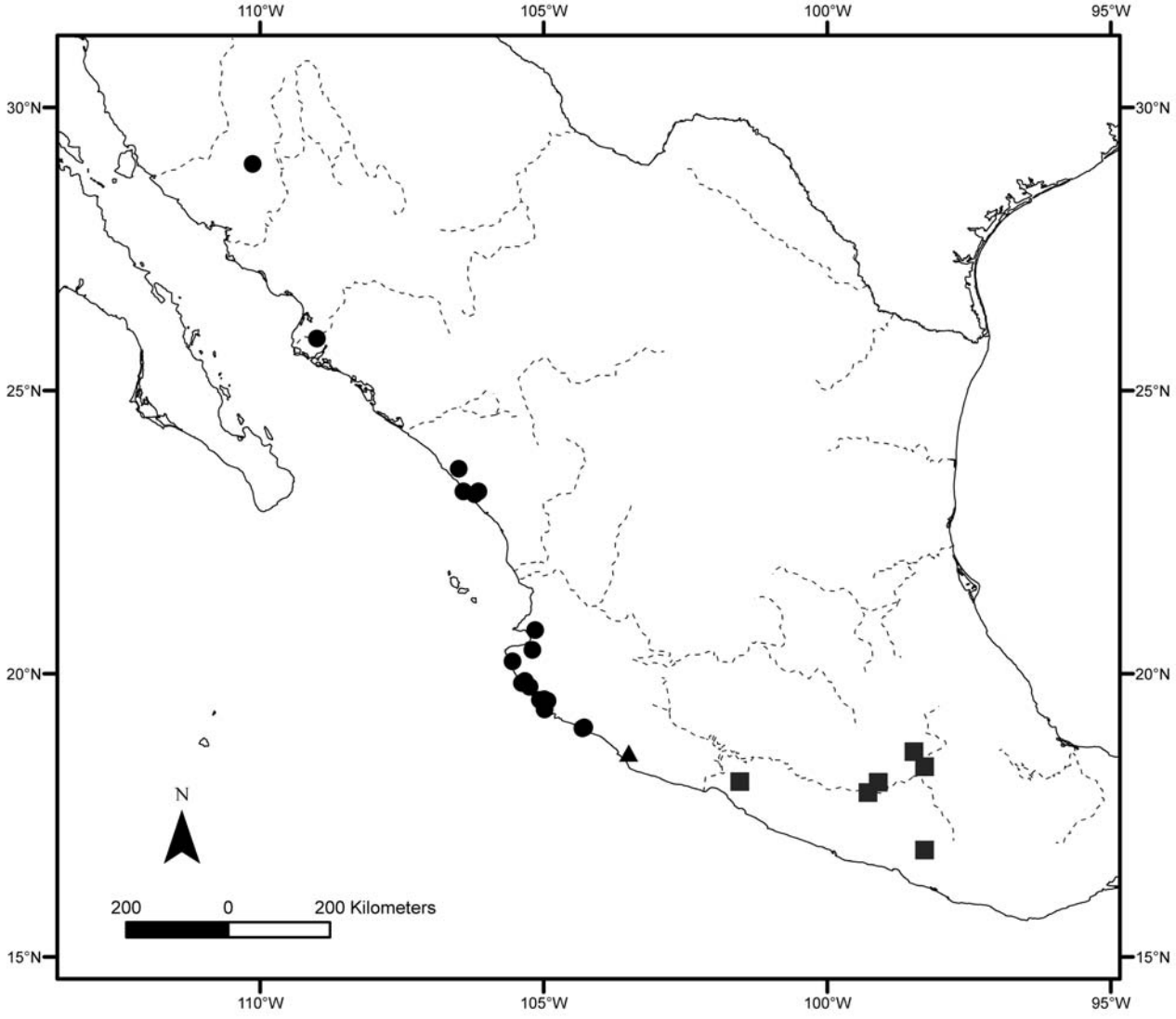

Fig. 22. Geographical range of *Acaciella rosei* (●), *A. sotoi* (▲) and *A. sousae* (■).

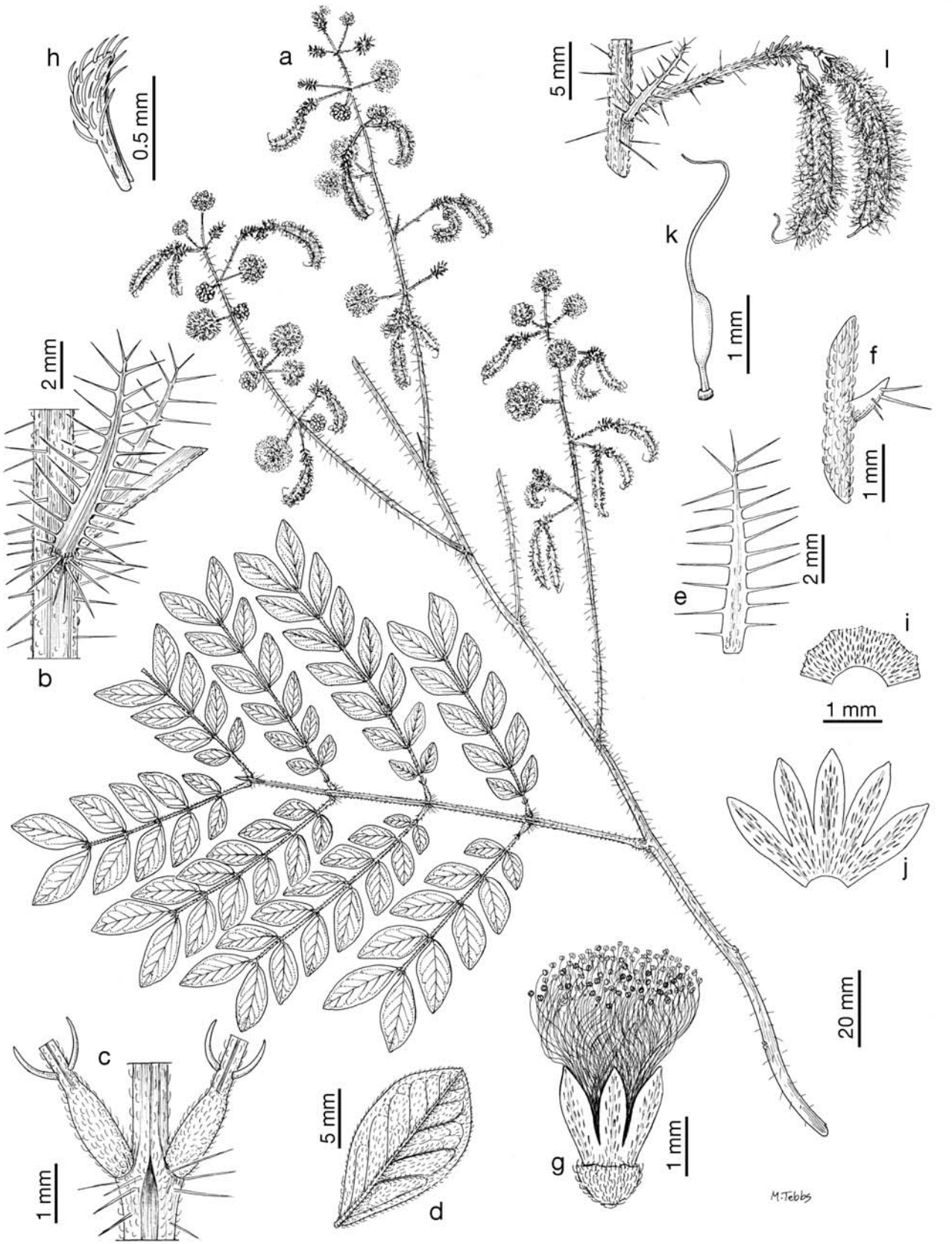

Fig. 23. *Acaciella sotoi*: **a,** habit and inflorescences, a few immature fruits; **b,** stipules; **c,** leaf fragment showing channelled rachis and paraphyllidia on pinnae bases; **d,** leaflet, underside; **e,** inflorescence bract from the peduncle base; **f,** inflorescence bract from the half way up the peduncle; **g,** complete flower; **h,** floral bract; **i,** calyx, opened out; **j,** corolla, opened out; **k,** gynoecium and basal nectary; **l,** infrutescence fragment. All from *J.C. Soto 11, 203*. Drawn by M. Tebbs.

Shrub to 2 m tall, twigs and stems hirtellous-pilose. *Stipules* to 10 mm long, c. 1 mm wide, fugacious. *Leaves* 11-16 cm long; petiole to 3 cm long; rachis 3-7 cm long, with hirtellous and sericeous hairs; with 3-4 pairs of pinnae; pinnae 3-9 cm long; paraphyllidia 1 mm long, fugacious; leaflets 5-7 pairs per pinna, 1.2-2.8 × 0.7-1.5 cm, ovate-rhombic, base and apex acute, brochidodromous venation evident on both surfaces, but more so on the lower surface, puberulous above, sericeous on the lower surface, coriaceous. *Racemes* in terminal panicles, less frequently in axillary fascicles, main rachis 10-15 cm long, with hirtellous and sericeous hairs; peduncles 1-1.5 cm long, sericeous, without pearl glands; 2 inflorescence bracts at the peduncle base, these 8 mm long, linear-triangular, pilose, fugacious, another bract about half way up the peduncle, 1 mm long, sericeous; floral bract 0.7 mm long, with sparse strigose and pilose hairs, clavate, fugacious, very conspicuous when the inflorescence is immature; pedicels 1 mm long, glabrous; flowers white, when dry orange, in short racemes, 12-14 mm in diam. at anthesis. *Calyx* 0.75 mm long, 5-lobed, the lobes less than ¼ the length of the whole calyx, calyx almost truncate, sericeous. *Corolla* 2-2.5 mm long, 5-lobed, the lobes to more than half the whole corolla length, sericeous. *Stamens* 4 mm long. *Ovary* 0.75 mm long, glabrous, short-stipitate, the stipe shorter than the ovary, c. 0.5 mm long; basal nectary 0.25 mm high. *Legume* densely villose-pubescent, stipitate. *Seeds* not seen. Fig. 23.

Distribution. Mexico: Michoacan endemic. Fig. 22.

Habitat. Medium stature deciduous forest (trees above 20 m tall, but less than 35 m). Alt. 60 m.

Phenology. Flowering in October; immature fruits in October.

Taxonomic comments. Acaciella sotoi is closely related to *A. rosei* which has shorter stipules (2-2.5 mm long); shorter leaves (to 15 cm long), glabrous petioles; less pinnae (only 1-2 pairs) longer paraphyllidia (2.5 mm long) fewer leaflets (2-3(4) pairs per pinna) these elliptic to widely elliptic, and the legume is glabrous. *A. sotoi* also has a pubescence on the leaflets and fruit similar to that of *A. tequilana* var. *pubifoliolata* but the leaflets of *A. sotoi* are ovate-rhombic and not circular in outline. In addition, the two species have a different distribution and phenology.

Conservarion status. Acaciella sotoi is only known from the type locality which is 7 km north west of La Placita in the municipality of Aquila, Michoacan (*Soto 11, 203*, collected in 1985). A previous systematic survey of the region by *Bruno Guerrero* in 1979-1980 did not reveal the existence of this species. The seasonally dry forest in this region is thought to be fairly well preserved, however, the collection was made along a roadside in secondary vegetation. This species is thought to be extremely rare and very few, if any, populations may still be extant. A rating of Critically Endangered (CR) based on criterion D is recommended.

Representative specimens

MEXICO. **Michoacán**: a 7 km al NW de La Placita, municipio de Aquila, 18º 36' N, 103º 30' W, 60 m, 20-X-1985, *Soto, J.C. 11203* (BM, K, MEXU, MO).

13. Acaciella sousae (L. Rico) L. Rico, Kew Bull. 59: 328. 2004.

Acacia sousae L. Rico, Brittonia 39: 130. 1987.
Type: Mexico: Guerrero, Distrito de Mina, Puerto de la Calavera, *G.B. Hinton 9541* (holotype, US!; isotypes, GH!, K!, NY!, P!, TEX!).

Shrub to 1.6 m tall; twigs glabrous, glaucous. *Stipules* lanceolate, up to 5 mm long, fugacious. *Leaves* 9-18 cm long, petiole (2.5)3.8-5.5 cm long, terete, glabrous; rachis 2.8-3.4 cm long, glabrous, with 1-3 pairs of pinnae; pinnae 5-12 cm long; paraphyllidia 1.5 mm long; leaflets 1-3 pairs per pinna, (1.8)3-4.5 × (1.2)2-3.5 cm, broadly obovate, base oblique, apex rounded, venation brochidodromous, main vein subcentral at the base, central towards the apex, secondary venation conspicuously pinnate-reticulate, glabrous, chartaceous. *Inflorescences* consisting of solitary, axillary capitulum-like racemes, or in clusters of up to 5 capitulum-like racemes, main axis to 23 cm long, glabrous; peduncles 1.5 cm long; glabrous; inflorescence bracts not seen; floral bract 0.75 mm long, glabrous, clavate, fugacious; pedicels 1.5-2 mm long, glabrous; flowers white, yellow when dry, these up to 6 mm in diam. at anthesis. *Calyx* 1 mm long, 5-lobed, the lobes less than ¼, the length of the whole calyx, glabrous. *Corolla* 2.4 mm long, 5-lobed, the lobes to more than half the whole corolla length, glabrous. *Stamens* 7-8 mm long. *Ovary* 1 mm long, glabrous, short-stipitate, the stipe shorter than the ovary; basal nectary 0.7 mm high. *Legume* 4.5-5.5 × 1.3-1.8 × 0.3 cm, flat, straight, late dehiscent; valves chartaceous, conspicuously reticulate, glabrous, rounded at the base and apex; stipe 1.5-2 cm long; beak present, 4 mm long, very often breaking off. *Seeds* 4-7 per fruit, 4.3-4.5 × 3.3-3.5 × 0.6 mm. Fig. 24.

Distribution. Mexico central and southwestern: a species of restricted distribution, found only in the Rio Balsas Basin: Guerrero, Puebla and Morelos. Fig. 22.

Habitat. Low deciduous forest and transitional vegetation to xerophytic scrub (matorral), grassland; prefers limestone soils. Alt. 500-1500 m.

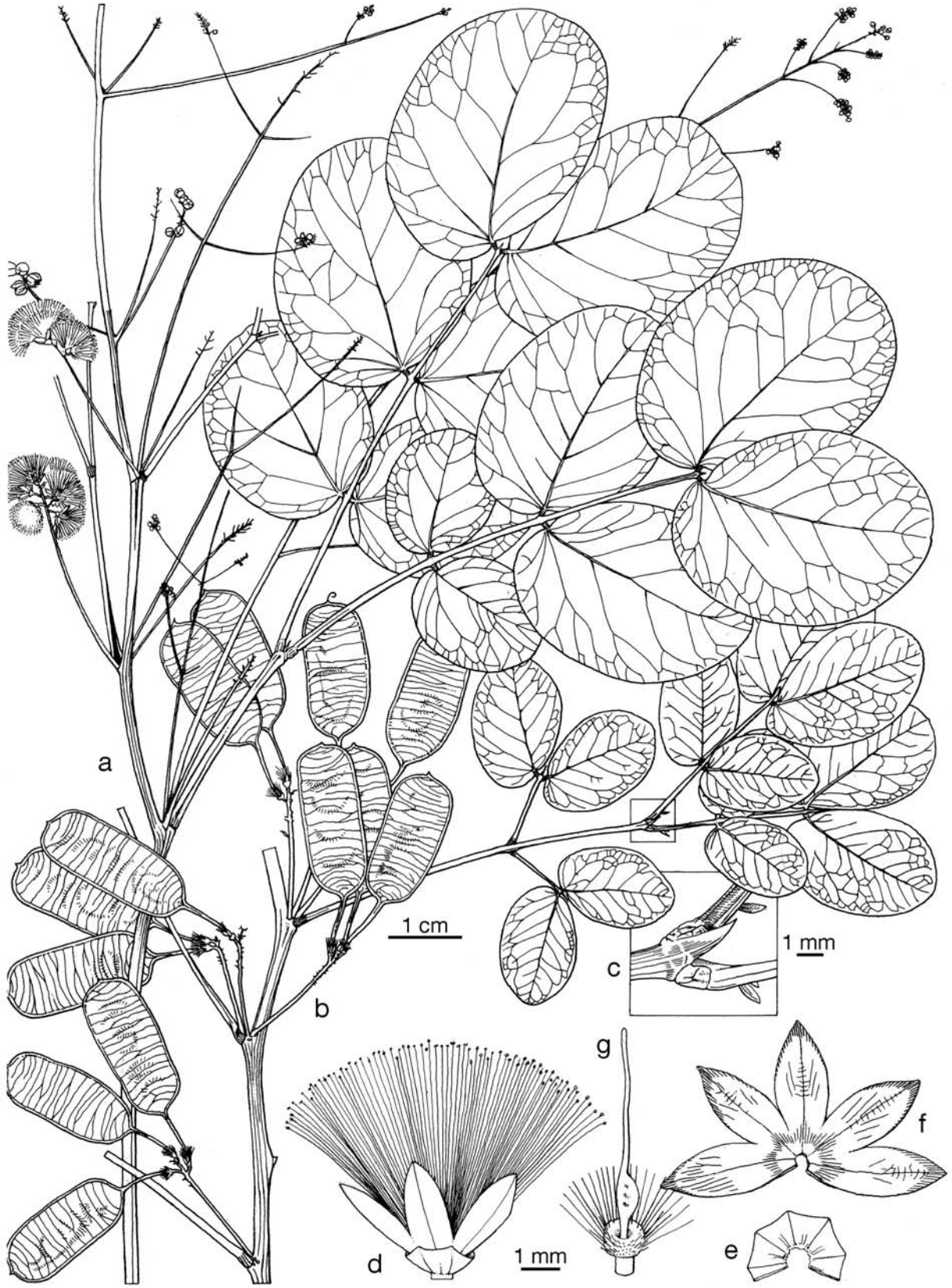

Fig. 24. *Acaciella sousae*: **a**, habit and inflorescence fragment; **b**, habit and infrutescence fragments; **c**, base of uppermost pinnae showing paraphyllidia and leaf appendix, abaxial view; **d**, complete flower; **e**, calyx, opened out; **f**, corolla, opened out; **g**, androecium, many stamens have been removed, gynoecium and basal nectary. a, d-g, from *Hinton & al. 9541*; b, c, from *Dorado 1359*. Drawn by E. Papadopoulos.

Phenology. Flowering in March, and September to October, fruiting from August to October.

Taxonomic comments. Acaciella sousae is a very distinctive shrub with glabrous, glaucous twigs and pink stem pith; it is similar to *A. tequilana* var. *tequilana*, which has more numerous elliptic to widely elliptic leaflets, those very often bicolorous. In contrast, *A. sousae* has dark, broadly obovate leaflets and conspicuous, almost black pulvinula. The distribution area of *A. sousae* is also more restricted.

Conservarion status. Acaciella sousae has a restricted EOO, but does not meet the threshold for a threatened category. However, it grows in broadly fragmented habitats of only a few scattered shrubs so is likely to have a small AOO (estimated to be 50-100 km^2). The influence of goat herding within the region is known to be causing increasing damage to the habitat. In addition, the species is found in basic limestone soils, so occurs in areas vulnerable to conversion for agriculture, especially plantations. With the restricted AOO and present threats, a rating of vulnerable (VU D2) is advised.

Representative specimens

MEXICO. **Guerrero**: 3 km W of Apanguito, Atenango del Río, 18º 05' N, 99º 06' W, 808 m, 5-X-1981, *Campos, G. 232* (FCME); Los Limones, km 62 road Cuernavaca-Iguala, 18º 04' N, 101º 35' W, 1200 m, 14-X-1987, *Contreras, J.L. 2155* (FCME); 3 km NW of San Francisco Ozomatlan, 17º 54' N, 99º 17' W, 1230 m, 19-IX-1989, *Vargas-Pérez, A. 100* (FCME). **Puebla**: 10 km adelante de Matamoros, 18º 36' N, 98º 28' W, 1500 m, 16-X-1984, *Dorado,O. 1199* (MEXU); Izúcar de Matamoros, 10 km adelante, rumbo a Tehuitzingo, 18º 21' N, 98º 17' W, 1500 m, 16-VIII-1984, *Dorado,O. 1359* (BM, K, MEXU).

14. Acaciella tequilana (S. Watson) Britton & Rose, N. Amer. Fl. 23: 105. 1928.

Acacia tequilana S. Watson, Proc. Amer. Acad. Arts 22: 409. 1887.

Type: Mexico: Jalisco, Tequila, *E. Palmer 539* (lectotype, designated here, GH!; isolectotypes, BM!, K!, NY, US!).

This species has characteristic elliptic to widely elliptic leaflets; these are highly variable in size, even on the same plant; based on habit and pubescence, three varieties, all of basically pacific distribution, are here recognised. *Acaciella tequilana* varieties and *A. sousae* belong to the same group of macrophyllidious species with rounded leaflet apices.

KEY TO THE VARIETIES OF *ACACIELLA TEQUILANA*

1. Branchlets and leaves glabrous ..... **14a.** var. **tequilana**
1. Branchlets and leaves yellow-hirsute or densely white-strigose 2
2. Leaflets almost glabrous, with plane margins; twigs yellow-hirsute ..... **14b.** var. **crinita**
2. Leaflets densely pubescent, with involute margins; twigs densely pubescent, tomentose-villose .... **14c**. var. **pubifoliolata**

14a. Acaciella tequilana (S. Watson) Britton & Rose var. **tequilana**

Acacia penicillata Standl., Contr. U.S. Natl. Herb. 20: 185. 1919. *Acaciella penicillata* (Standl.) Britton & Rose, N. Amer. Fl. 23: 104. 1828.

Type: Mexico: Oaxaca, Cerro San Felipe, *C. Conzattii & V. González 564* (lectotype, designated here, US!; isolectotypes, GH!, MEXU!).

Acacia laevis Standl., Contr. U.S. Natl. Herb. 20: 185. 1919. *Acaciella laevis* (Standl.) Britton & Rose, N. Amer. Fl. 23: 104. 1928.

Type: Mexico: Jalisco, near Guadalajara, *C.G. Pringle 11354* (lectotype, designated here, US!; isolectotypes, MEXU!, NY!).

Perennial *herb* or s*hrub* up to 3 m tall, glabrous, glaucous. *Stipules* to 4 mm long, fugacious. *Leaves* 9-27(36) cm long; petiole up to 5 cm long, terete, glabrous; rachis (3)8-16(18.5) cm long, glabrous, with (2)3-8 pairs of pinnae; pinnae (2.5)4-13 cm long; paraphyllidia 1.5 mm long; leaflets (6)14-30 pairs per pinna, (3)12-15 (20) × 3-8(17) mm, elliptic to widely elliptic, base oblique, apex rounded, brochidodromous venation well marked on both surfaces, glabrous, slightly chartaceous. *Inflorescences* usually open terminal panicles, with main rachis 20-55 cm long, glabrous; peduncles (1.5)2.5-3.5(4.5) cm long; glabrous, without pearl glands; inflorescence bracts 1-2 at the peduncle base, 3.5 mm long, glabrous, naviculiform, fugacious; flowers white, orange when dry, in short capitulum-like racemes, 15-18(20) mm in diam. at anthesis; floral bract c. 2 mm long, glabrous, fugacious; pedicels 1-2 mm long, glabrous. *Calyx* 0.7 mm long, almost truncate, glabrous. *Corolla* 3 mm long, 5-lobed, the lobes to more than half the whole corolla length, glabrous. *Stamens* 6 mm long. *Ovary* 2 mm long, glabrous, short-stipitate, the stipe shorter than the ovary; basal nectary 1 mm high. *Legume* 5.3-8.5 × 0.7-1.3 × 0.3 cm, flat, straight; valves chartaceous, conspicuously reticulate-veined, glabrous, acute at the base and apex; stipe 1.8 cm long; beak absent. *Seeds* 6-7 per fruit, elliptic to widely elliptic in outline, spherical, 3-4.5 × 3.5-4.5 × 1-2 mm. Fig. 25.

Distribution. Mexico north and central; from Chihuahua and Durango to Oaxaca and Puebla. Fig. 26.

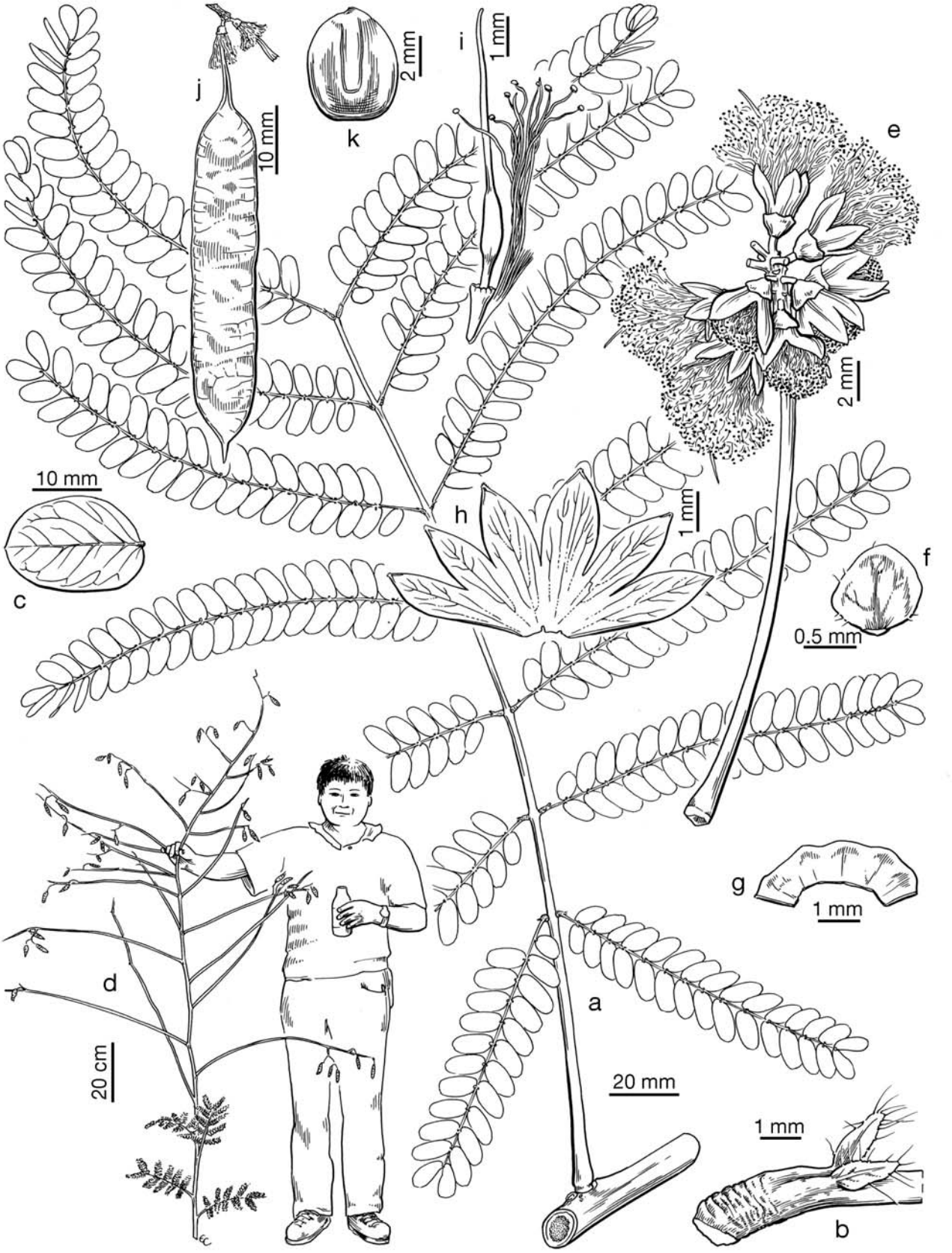

Fig. 25. *Acaciella tequilana* var. *tequilana*: **a,** leaf; **b,** base of a pinna showing paraphyllidia; **c,** leaflet, upper surface; **d,** habit showing leaves, part of stem and fruiting branches; **e,** detail of inflorescence; **f,** floral bract; **g,** calyx opened out; **h,** corolla opened out; **i,** gynoecium and a basal nectary together with a fragment of the numerous stamens; **j,** fruit and old flowers; **k,** seed front view showing narrow pleurogram. All from *J.C. Soto & al. 5626* except d (from photograph); j, from *Mexia 8850*. Drawn by E. Catherine.

Habitat. Quercus and *Pinus* forest, dry scrub with Cactaceae. Alt. 900-2500 m.

Phenology. Flowering from August to November, fruiting from September to December.

Taxonomic comments. A. tequilana var. *tequilana* has a very long (to 55 cm), open paniculate inflorescence, the longest in the genus. As in *A. sousae* it has a glaucous, smooth, glabrous stem with a pink pith (this visible in cross section).

Vernacular names and uses. Guasillo, timbre; the roots are used for tanning.

Conservarion status. Acaciella tequilana var. *tequilana* is widely distributed across Mexico and is represented by a large number of collections in herbaria. Collections have been made recently indicating that populations are still extant. A rating of Least Concern (LC) is given.

Representative specimens

MEXICO. Rincón del Cañón, *Hinton, G.B. 5406* (G). **Chihuahua**: Balleza, 26º 57' N, 106º 21' W,-IX-1977, *Enríquez Andrés 194* (NY). **Durango**: Reserva de la Biosfera La Michilia, Arroyo El Taray, 23º 25' 59'' N, 104º 14'16'' W, 2400 m, 28-VIII-1995, *García, A. 2038* (CIIDIR, K); al N de Tuitán, municipio del Nombre de Dios, 24º 02' N, 104º 15' W, 19-IX-1981, *González, S. 2018* (IEB). **Guanajuato**: Penjamo, 12 km al N de Tierras Negras, 20º 23' N, 101º 42' W, 2200 m, 18-XI- 1991, *Rzedowski 51310* (IEB). **Guerrero**: Tlacotepec, 11.4 km al S de camino a Verde Rico, 17º 41' N, 99º 56' W, 1180 m, 5-X-1998, *Cruz Durán, R. 3018* (MEXU); Rio, Sierra Madre del Sur, north of Rio Balsas, Cerro de la Guacamaya, Temisco, 17º 06' N, 99º 04' W, 18-XI- 1937, *Mexia, I. 8850* (K, NY). **Hidalgo**: Metzquititlán, Barranca de Venados, 20º 42' N, 98º 56' W, 1800 m, 6-VIII-1979, *Hernández M., R. 3584A* (MEXU). **Jalisco**: 20 al W de Guadalajara, Bosque de la Primavera, 20º 43' N, 103º 33' W, 1600 m,-VII-1977, *Alonso, G. s.n.* (IBUG); km 10 de la carr. que va de Tesistán a San Cristóbal de la Barranca, 20º 14' N,

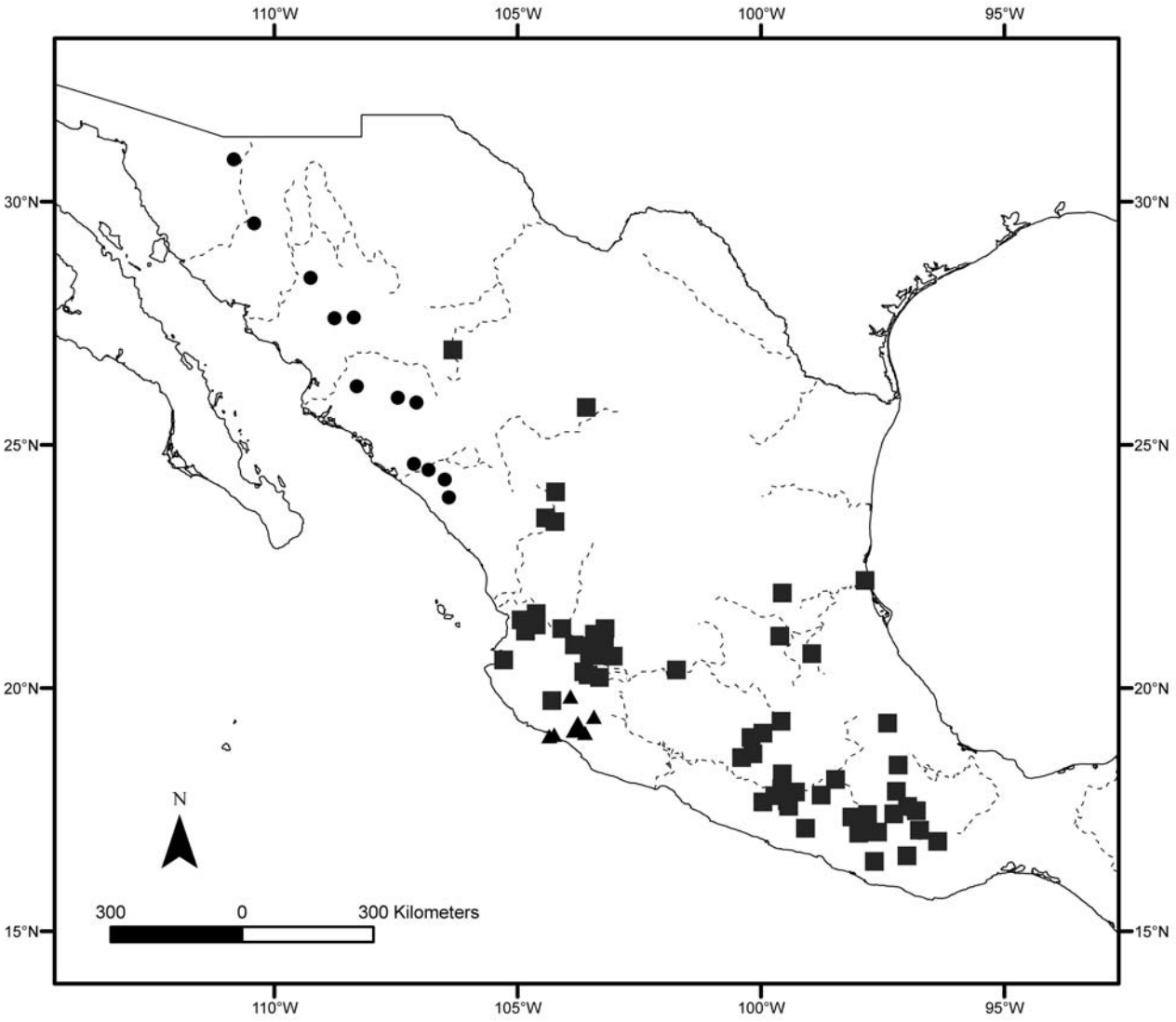

Fig. 26. Geographical range of *Acaciella tequilana* var. *tequilana* (■), *A. tequilana* var. *crinita* (●) and *A. tequilana* var. *pubifoliolata* (▲).

103º 25' W, 1500 m, 22-VII-1990, *Chazaro B., M. 6306* (IEB, MEXU). **México**: Temascaltepec, 19º 02' N, 100º 03' W, 29-IX-1933, *Hinton, G. B. 4852* (BM, MO, NY); San Pedro y Palmar Grande, 18º 34' N, 100º 24' W, 500 m, 26-XI- 1954, *Matuda 32071* (MEXU). **Nayarit**: 4 km al SE de Santa María del Oro, 21º 20' N, 104º 35' W, 900 m, 7-XI- 1993, *Rico, L. 2001* (MEXU); 3 km al SE de El Refugio, camino a Guadalajara, Mpio. Tepic, 21º 24' N, 104º 53' W, 6-IX-1985, *Téllez, O. 9010* (IBUG, K, MEXU). **Oaxaca**: Cerro San Felipe, *Conzatti 564* (GH, MEXU, US); Nueve Puntas, estacion de microondas, a 7 km al SE de Matatlán, 16º 50' N, 96º 20' W, 2050 m, 17-IX-1978, *Sousa, M. 9399* (BM). **Puebla**: Hacienda Noria, Río Atoyac, 19º 18' N, 97º 24' W, 25-VII-1925, *Antonio, Hno. s.n.* (MEXU); Atoyac, Río, 18º 25' N, 97º 11' W, 15-VII-1910, *Nicolás Hno. s.n.* (K). **Querétaro**: 4-8 km NE de Bucareli (NW 21 99), 21º 03' N, 99º 37' W, 1300 m, 18-XII-1978, *Zamudio, S. 3612* (IEB). **San Luis Potosí**: Las Canoas, 21º 57' N, 99º 32' W, 17-X-1891, *Pringle 3916* (BM, NY). **Tamaulipas**: Tampico, La Laguna de Chaivel, 22º 13' N, 97º 51' W, 5 m, 14-IX-1967, *Rzedowski 45956* (ENCB). **Zacatecas**: Sierra de Morones, cerro Piñones, 2 km al W de rancho de Jesús Ayala, 21º 12' 24'' N, 103º 13'11'' W, 2000 m, 14-IX-1999, *Balleza C., J.J. 10949* (MEXU).

14b. Acaciella tequilana var. **crinita** (Brandegee) L. Rico, **comb**. & **stat. nov**.

Acacia crinita Brandegee, Zoe 5: 198. 1905, basion. *Acaciella crinita* (Brandegee) Britton & Rose, N. Amer. Fl. 23: 105. 1928.

Type: Mexico: Sinaloa, E of Culiacán, Cerro Colorado, ca. 35 km from Durango border, *Brandegee s.n.* (holotype, CAS).

Acaciella durangensis Britton & Rose, N. Amer. Fl. 23: 105. 1928.

Type: Mexico: Durango, Sianori, *González Ortega 5299* (holotype [fragment], NY!; isotypes, MEXU!, US).

Shrub up to 5 m tall, villous-hirsute with white or yellow hairs throughout. *Stipules* 5-8 mm long, linear, ciliate, fugacious. *Leaves* 13 cm long; petiole 2-2.5 cm long, terete, usually densely hirsute; rachis 1.5-8 cm long, hirsute, with 2-5 pairs of pinnae; pinnae 4-10 cm long; paraphyllidia c. 1 mm long; leaflets (4)5-9(16) pairs per pinna, 10-25 × 4-1.5(23) mm, elliptic, base rounded to oblique, apex rounded, venation brochidodromous, glabrous on both surfaces, membranaceous, insertion central. *Inflorescences* consisting of clusters of 2-3 axillary or terminal racemes, main axis 22-27 cm long, densely hirsute to glabrescent; peduncles 1-3(4) cm long; densely yellow-hirsute, without pearl glands; one inflorescence bract close to the flower head or near middle of the peduncle, 1.2 mm long, with long cilia, clavate, fugacious; floral bract 0.5-0.75 mm long, glabrous or with a few long hairs, lanceolate, fugacious; pedicels 0.75-1 mm long, glabrous; flowers white, cream or pink, when dry reddish, in capitulum-like racemes,18(20) mm in diam. at anthesis. *Calyx* 1.25 mm long, 5-lobed, almost truncate, glabrous. *Corolla* 4 mm long, 5-lobed, the lobes to more than half the whole corolla length, glabrous. Stamens 7 mm long. *Ovary* 1.5 mm long, glabrous, the stipe 1.25 mm long; basal nectary 0.35 mm high. *Legume* 4.5-5.5(8) × 1-1.2 × 0.2 cm, flat, straight; valves chartaceous, conspicuously reticulate-veined, glabrous, rounded at the base, acute at apex; stipe 1.3 cm long; without a conspicuous beak. *Seeds* 6-8 per fruit, 4-4.2 × 3-3.5 × 1.5 mm, only seen immature. Fig. 27 a-h.

Distribution. Mexico north: Chihuahua, Durango, Sinaloa and Sonora. Fig. 26.

Habitat. In low deciduous forest, *Quercus* forest, mixed *Pinus-Quercus* forest, desertic scrub with *Prosopis* and *Lycium*; on rocky and grassy slopes. The taxon resprouts readily after grassland fires. Alt. 300-1200 m.

Phenology. Flowering December to July, fruiting in March.

Vernacular names. Gato, La nudita [lanudita, probably referring to the hairiness of the plant]

Taxonomic comments. A. tequilana var. *crinita* has a characteristic yellow-hirsute indument along the stems, the trichomes can reach 5 mm in length (*Tenorio* 13512); the leaflets have plane margins; occasionally the plant tends to be glabrescent and the fruit is glabrous. These features combined are not seen in the other two varieties.

Conservarion status. Acaciella tequilana var. *crinita* is known to grow as scattered individuals in habitats affected by regular fires. Another threat to this species is the loss of desert scrub and forested areas in Sonora over recent years. Although not restricted in range extent this species may be threatened with an overall population size reduction, but without sufficient evidence a rating of Near Threatened (NT) is given.

Representative specimens

MEXICO. **Chihuahua**: Sierra Charuco, Río Mayo, 27º 36' N, 108º 45'05'', 800 m, 23-VII-1936, *Gentry H.S. 2325* (K, MEXU, MO). **Durango**: Sierra Tres Picos, 1000 m, 19-XII-1939, *Gentry H.S. 5278* (MO); Sianori, 25º 13' N, 106º 47' W, 939 m, *González Ortega, J. 5299* (K, MEXU). **Sinaloa**: Guadalupe de los Reyes, Cosala, 37 km E, 24º 17' N, 106º 30' W, 900 m, 17-III-1985, *Beltrán, A. 385* (FCME); arriba de Guadalupe de los Reyes, 24º 29' N, 106º 50' W, 1000 m, 17-III-1985, *Tenorio, P. 8367* (BM, MEXU). **Sonora**: Sierra La Chuna, Sapopa Canyon, Rio Mayo, 25º 52' N, 107º 05' W, 1926 m, 27-II-1935, *Gentry H.S. 1370* (K, MEXU, MO); Rancho el Aguilar, 29º 33' N, 110º 25' W, 500 m, 21-IV-1991, *Joyal, E. 1998* (MEXU).

14c. Acaciella tequilana var. **pubifoliolata** L. Rico, **var. nov.**

Type: Mexico: Colima, on the road from Colima to Minatitlán, 12 km from Colima, steep slopes,

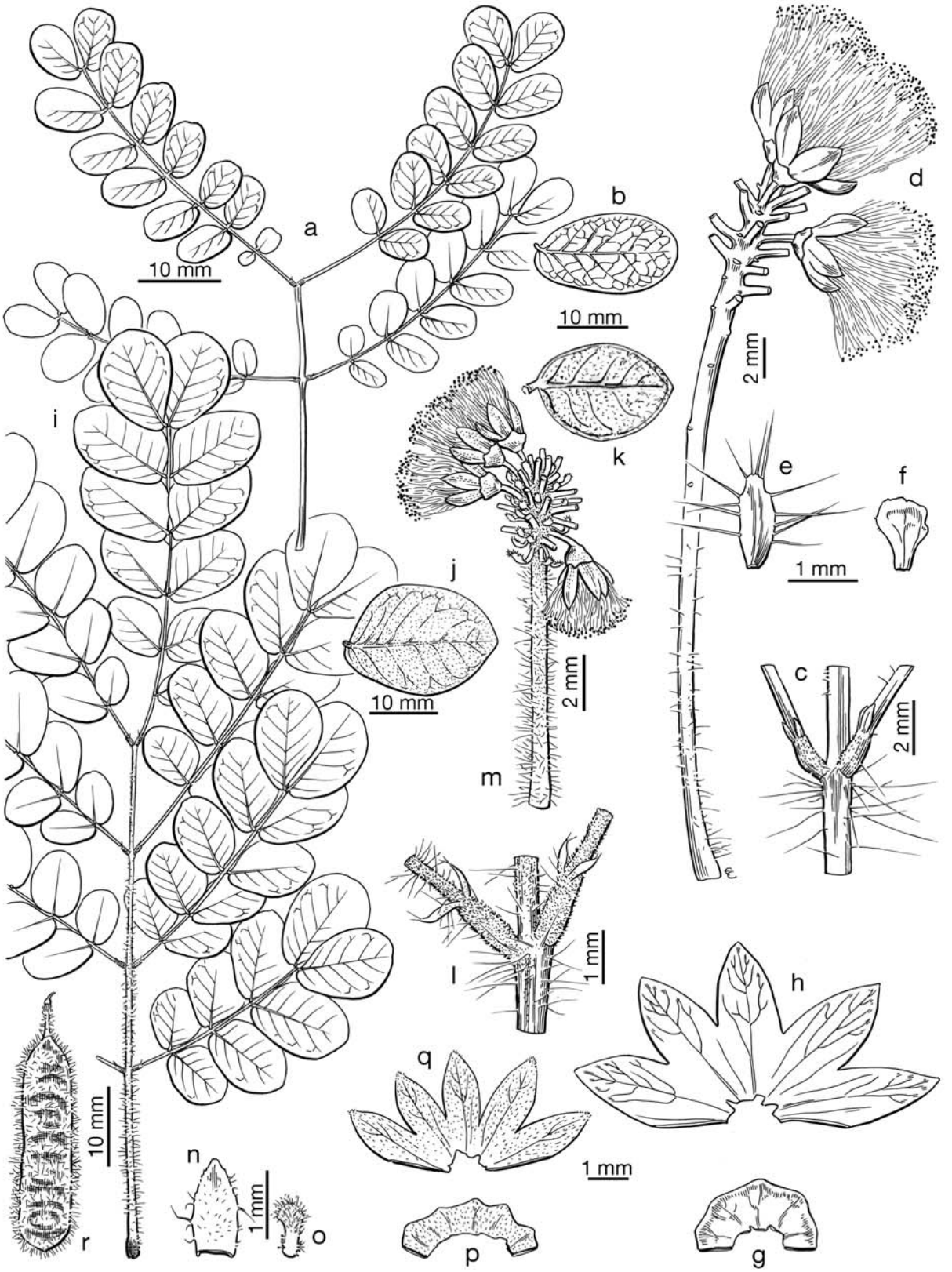

Fig. 27. *Acaciella tequilana* var. *crinita*: **a,** leaf; **b,** leaflet underside; **c,** leaf fragment showing rachis, paraphyllidia on pinnae bases, and pubescence; **d,** fragment of inflorescence, many flowers have been removed; **e,** stipule; **f,** floral bract; **g,** calyx, opened out; **h,** corolla, opened out; *Acacia tequilana* var. *pubifoliolata*: **i,** leaf; **j,** leaflet upper surface; **k,** leaflet under surface; **l,** leaf fragment showing rachis, paraphyllidia on pinnae bases, and pubescence; **m,** inflorescence (many flowers have been removed); **n,** stipule; **o,** floral bract; **p,** calyx, opened out; **q,** corolla, opened out; **r,** fruit. a, from *Tenorio* 8477; b, f, from *Gentry 2325*; c-e, g, from *Tenorio 13512*; h, from *Santana 867*; j, m, n, q, *Macqueen 188*; k, l, o, p, *Santana & Cervantes 812b*. Drawn by E. Catherine.

19º17' N, 103º46' W, *D. Macqueen 188* (holotype, MEXU!; isotypes, EAP, FHO, K!).

Similis typicae varietati (var. tequilana) sed ab ea differens caulibus indumento flavo hirsutis vel hispidis, stipulis longioribus, petiolo breviore atque pilis flavis hirsuto, paraphyllidiis brevioribus, foliolis in unaquaque pinna minus numerosis, fere velutinis, margine involutis, inflorescentiae axe breviore, pilis flavis hirsuto, pedunculis hirtulis, racemis tenuioribus, calyce longiore, piloso, corolla pilosa et legumine minute denseque hirsuto.

Perennial *herb* or *shrub* to 4 m tall; twigs yellow-hirsute to hispid. *Stipules* triangular, 4-5 mm long, fugacious. *Leaves* 12 cm long; petiole 3.5-4 cm long, hirsute; rachis 6-12 cm long, white and yellow-hirsute, with 3-4 pairs of pinnae; pinnae 4-7 cm long; paraphyllidia 0.5 mm long; leaflets 4-5(7) pairs per pinna, 1-2.5 × 0.5-1.2 cm, elliptic, base acute, apex slightly acute, venation brochidodromous, puberulous on both surfaces, chartaceous, almost velutinous, margins involute. *Inflorescences* consist of clusters of 3-5 axillary or terminal racemes, main axis 15-18(22) cm long, yellow-hirsute; peduncles 1-1.5(2) cm long, puberulous hirsute, without pearl glands; two inflorescence bracts, one at the peduncle base, 3.5 mm long, puberulous and ciliate, linear, fugacious, another near to the capitulum-like raceme, 1.5 mm long, linear, long-puberulous, fugacious; floral bract 0.75 mm long, long- puberulous, clavate, fugacious; pedicels up to 1.5 mm long, glabrous; flowers white, becoming orange or reddish when dry, in short capitulum-like racemes up to 14 mm long at anthesis. *Calyx* 1.2 mm long, 5-lobed, the lobes almost truncate, pubescent. *Corolla* 3 mm long, 5-lobed, the lobes to more than half the whole corolla length, pubescent. *Stamens* 5 mm long. *Ovary* 1.2 mm long, glabrous, short-stipitate [the stipe 0.75mm long]; basal nectary 0.5 mm high. *Legume* 5-6.5 × 0.8-1.2 × 0.3 cm, flat, straight, dehiscent along both sutures; valves chartaceous, densely hirsutellous, rounded at the base and apex; stipe c. 1 cm long; beak 1.2 -1.3(1.5) mm long. *Seeds* 5 per fruit, ovoid, 4 × 3 × 2 mm. Fig. 27 i-r.

Distribution. Mexico central: Jalisco and Colima. Fig. 26.

Habitat. In scrub and low deciduous forest with *Acacia cochliacantha* and *Caesalpinia sp. pl.* as dominants; on feozem type clay soil (formed by haplic+vertisol+litosol). Alt. 300-900 m.

Phenology. Flowering from September to November; fruiting in November.

Taxonomic comments. This variety is easily recognised by its very pubescent leaflets with the whole margin involute. The pod is densely hairy from juvenile to mature stages; there are another five taxa of *Acaciella* with hairy pods; *A. bicolor*, *A. lemonnii* (which tends to be glabrescent), *A. painteri* var. *painteri*, *A. sotoi* and *A. villosa*. *Acaciella tequilana* var. *pubifoliolata* appears to be sister to *Acaciella tequilana* var. *tequilana* and *A. villosa*. It differs from *A. tequilana* var. *tequilana* because var. *pubifoliolata* has yellow hirsute to hispid hairs on the stems, stipules 4-5 mm long, the petiole 3.5-4 cm long and white yellow-hirsute, the pinnae in 3-4 pairs, the paraphyllidia 0.5 mm long, 4-5(7) pairs of leaflets per pinna, these elliptic, puberulous on both surfaces, almost velutinous, and with involute margins. In addition the inflorescence main axis is 15-18(22) cm long, yellow-hirsute, the peduncles 1-1.5(2) cm long, puberulous-hirsute, the racemes to 14 mm in diam. The calyces are 1.2 mm long, pubescent, the corollas 3 mm long, pubescent, the legume densely hirsutellous. *Acaciella tequilana* var. *pubifoliolata* differs from *A. tequilana* var. *crinita* because the latter has leaflets with plane margins and the legumes are glabrous.

Conservarion status. Acaciella tequilana var. *pubifoliolata* is endemic to the states of Colima and Jalisco in Mexico. Distribution is restricted and meets the endangered threshold (EN) for EOO. Extensive cultivation occurs in this region and natural habitat exists in patches surrounded by expanding urban settlements and farms. With increasing prosperity of the region and improved communication links (e.g. new roads to allow heavy goods vehicles access to farms) it is likely that the habitat will continue to be encroached upon, so a continuing decline is inferred. A rating of EN B1ab (iii) is suggested here.

Representative specimens

MEXICO. **Colima**: Tecolapa, Cerro Calderas, 19º 01' N, 103º 81' W, 397 m, 18-X-1987, *Leger, F. Cuida 1149* (MEXU); El Colomo, 10 km al SW de la Cd. de Manzanillo, 19º 03' N, 104º 15' W, 350 m, 17-I-1984, *Santana, F.J. 746* (IBUG); 5 km al NE de Jala, brecha Jala-Coquimatlán, 19º 08' N, 103º 51' W, 400 m, 30-X-1984, *Santana, F.J. 867* (IBUG, MEXU). **Jalisco**: a 8 km al NE de la desviación a Tuxcacuesco, Mpio. de Venustiano Carranza, 19º 50' N, 103º 55' W, 898 m, 5-IX-1979, *Magallanes, J.A.S. 1881* (MEXU, MO); El Platanar, camino El Naranjo-La Higuerilla; Municipio de Pihuamo, 19º 25' N, 103º 26' W, 23-XI-1981, *Magallanes, J.A.S. 3294* (MEXU).

15. Acaciella villosa (Sw.) Britton & Rose, N. Amer. Fl. 23: 104. 1928.

Mimosa villosa Sw. Fl. Ind. Occ. 2: 982. 1800. *Acacia villosa* (Sw.) Willd., Sp. Pl. 4: 1067. 1806.

Type: Mexico: Veracruz, *Houston* s.n. (lectotype, designated here, BM-herb. Sloane!).

Acacia carbonaria Schldl., Linnaea 12: 571. 1838. *Acaciella carbonaria* (Schldl.) Britton & Rose, N. Amer. Fl. 23: 98. 1928. Bässler (1998) equated *Acacia carbonaria* Schldl. with *Mimosa villosa* Sw.

Type: Mexico: Veracruz, inter Veracruz et Plan del Río, *Schiede & Deppe 695* (holotype, HAL; fragment and photograph of type US!).

Acacia cumingii Benth., Hook. Lond. Journ. Bot. 1: 525. 1842. *Acaciella cumingii* (Benth.) Britton & Rose, N. Amer. Fl. 23: 104. 1928.

Type: "Panama et Columbia occidentalis", 1831, *H. Cuming 1242* (lectotype, designated here, K!; isolectotype, US).

Mimosa microphylla Mociño & Sessé, Flora Mexicana 225. 1895.

Type: Mexico: without exact locality, *Mociño & Sessé* s.n. (lectotype, designated here, MA; isolectotype, OXF!).

Acacia polypodioides Standl., Contr. U.S. Natl. Herb. 20: 184. 1919.

Type: Mexico: Chiapas, Chiapa de Corzo, *E.A. Goldman 1001* (lectotype, designated here, US!; isolectotype [fragment], NY!).

Acacia calderonii Standl., J. Wash. Acad. Sci. 12: 439. 1923. *Acaciella calderonii* (Standl.) Britton et Rose, N. Amer. Fl. 23: 99. 1928.

Type: Guatemala: Cerro de la Olla, cerca de Chalchuapa (El Salvador), *S. Calderón 977* (lectotype, designated here, US-1151942!; isolectotype, NY!).

Acaciella rekoi Britton & Rose, N. Amer. Fl. 23: 98. 1928.

Type: Mexico: Oaxaca, Las Pilas, *B.P. Reko 3612* (holotype, US!; isotype, NY!).

Acaciella fisheri Britton & Rose, N. Amer. Fl. 23: 99. 1928.

Type: Mexico: Veracruz, Mata de Agua, *G.L. Fisher 81* (holotype, NY!; isotypes, GH!, US!).

Acaciella bakeri Britton & Rose, N. Amer. Fl. 23: 99. 1928.

Type: Nicaragua: Granada, *G.F. Baker 116* (holotype, NY!; isotypes, GH!, MICH, US!).

Acaciella oerstedii Britton & Rose, N. Amer. Fl. 23: 104. 1928.

Type: Costa Rica: without exact locality, 1846-1848, *A.S. Oersted s.n.* (lectotype, designated here, NY; isolectotypes, BM!, K!).

Acacia valenzuelana A. Rich., Hist. Phys. Cuba, Pl. Vas.: 462. 1846. *Acaciella valenzuelana* (A. Rich.) Britton & Rose, N. Amer. Fl. 23: 104. 1928.

Type: Cuba: [Province of Pinal del Río] Vuelta de Abajo, *Ramón de la Sagra s.n.* (lectotype, designated by Bässler, 1998: 101, P!; isolectotypes [fragment], NY!).

Shrub or tree to 2-5 m tall, glabrous to yellow-hirsute pubescent. *Stipules* linear, 3.5-5 mm long, fugacious. *Leaves* 7-16(24) cm long; petiole (1.5)2.5-3 cm long, terete, pubescent; rachis 2.5-5 (6) cm long, pubescent, with (3)4-9 pairs of pinnae; pinnae 3.5-5.5 cm long; paraphyllidia 0.3-0.5 mm long; leaflets 9-29 pairs per pinna, (1)2.5-6(10) × 2.5-3(5) mm, oblong, chartaceous, base truncate to truncate-oblique, apex acute to apiculate, main vein subcentral, very inconspicuous reticulate venation visible only on the undersurface, strigose to sericeous pubescent on both surfaces, margins involute. *Inflorescences* consisting of clusters of (1)2-3 axillary, or sometimes terminal racemes, with an axis, 8-9(17) cm long, hirsutellous; peduncles (0.7)1.5-2 cm long; strigose, pubescent, without pearl glands; two inflorescence bracts, pubescent, one on the peduncle base, 2 mm long, fugaceous, another inserted about the middle of the peduncle or near to the raceme, 1.5 mm long, fugacious; floral bract 1 mm long, pubescent, clavate, persistent almost until anthesis; pedicels 1.5-2 mm long, glabrous, without pearl glands; flowers white, when dry reddish, in capitulum-like racemes, 1.3-1.5 mm in diam, occasionally the racemes elongate to 2 cm in length at anthesis. *Calyx* (0.5)0.7(1) mm long, 5-lobed, the lobes less than ¼ the length of the whole calyx, usually glabrous or puberulous. *Corolla* 2.5-3 mm long, 5-lobed, the lobes to more than half the whole corolla length, pubescent only on the lobes. *Stamens* 5 mm long. *Ovary* 1-1.5 mm long, glabrous, short-stipitate, the stipe shorter than the ovary, c. 1 mm long; basal nectary 0.5 mm high. *Legume* (3.5)4-5(6) × 0.9-1.5 × 0.2 cm, flat, straight; valves chartaceous, densely pubescent, glabrescent, acute at the base and apex; stipe 7.5-13 mm long; legume usually with an apical beak. *Seeds* 4-8 per fruit, almost spherical, 5 × 3.5 × 2-3 mm. Fig. 28.

Distribution. Mexico central to Panama, and South America: Venezuela, Colombia, Ecuador and Peru; Caribbean: Jamaica. Presumably introduced in Cuba. Fig. 12.

Habitat. Thorny scrub with leguminous trees and cacti; secondary vegetation derived from low seasonally dry forest; *Quercus* and mixed *Pinus-Quercus* forest, sand dunes, grassland or savanna-like vegetation; the species tolerates acid and basic soils, those with volcanic parent rock or limestone, sands or clay-loams. Alt. (20)300-920(2000) m.

Phenology. Flowering and fruiting all year; lowest fruiting period April to July.

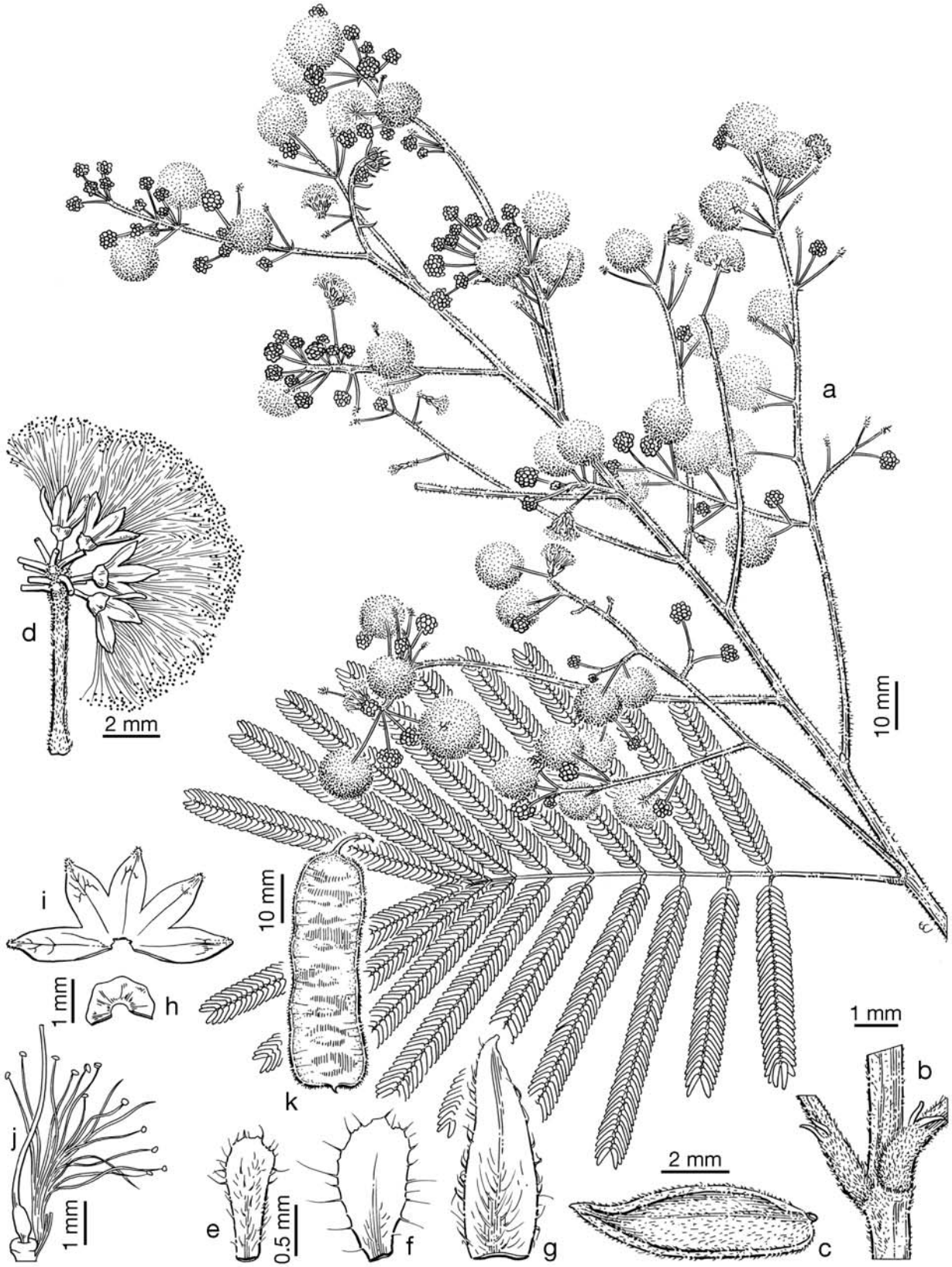

Fig. 28. *Acaciella villosa*: **a,** leaf and inflorescense; **b,** leaf fragment showing rachis, paraphyllidia on pinnae bases and pubescence; **c,** leaflet underside showing the involute margins, venation and pubescence; **d,** inflorescence fragment; **e,** floral bract; **f,** bract from the peduncle apex, near to the flowers; **g,** bract from the peduncle base; **h,** calyx, opened out; **i,** corolla, opened out; **j,** androecium (many stamens have been removed), gynoecium and and basal nectary; **k,** fruit showing a small beak. All from *Hinton & al. 10815*. Drawn by E. Catherine.

Taxonomic comments. This is the second most widely distributed species of *Acaciella*, occurring from southwest Mexico to Peru. It is easily recognised by its involute and densely pubescent leaflets. A few collections have yellow-pubescent branches and leaves. In Colombia, Venezuela, Peru and Ecuador most of the collections are less hairy, often glabrous on the upper surface of the leaflets, and the branchlet indumentum tends to be sericeous. The altitudinal range for the South American specimens is between 1, 100-2000 m. All known collections are from the wild, with the exception of one cultivated specimen from Maracaibo Botanic Garden (Venezuela), originating from seed collected by *Bunting* (no. 6030), one from CIAT (seed bank in Colombia) and another from Cuba (probaly introduced). Bässler (1998) equated *Acacia valenzuelana* (A. Rich.) Britton & Rose with *Acacia glauca* (L.) Moench; however, based on careful observation of numerous Caribbean material (including types) and geographical distribution, *A. valenzuelana* is here placed as a synonym of *Acaciella villosa*, but *Acacia glauca* as a synonym of *Acaciella glauca*. Bässler commented that after collection of the type of *A. valenzuelana* some time between 1822 and 1835 it has not been collected again in Cuba. With the exception of the type specimen of *A. valenzuelana*, we have seen no other collections of *A. villosa* from Cuba; the former was described as 'piloso-ferruginea' and it was distinguished from *A. villosa* because it has more numerous and larger leaflets, characteristics highly variable within the current circumscription of *A. villosa*. As *A. villosa* has been frequently introduced as an experimental agroforestry species or ornamental in other countries, it is possible that material of it was introduced to Cuba. In contrast, *A. villosa* is well represented in collections from Jamaica. The placement of *A. glauca* as distinct from *A. villosa* agrees with Adams (1972: 336) based on his careful study of the Linnaean specimens for the Flora of Jamaica.

Conservarion status. Acaciella villosa is widely distributed across southern Mexico and has a large range extending into South America and the Caribbean. Although not as invasive as *A. angustissima* var. *angustissima* it does produce large quantities of seed. A rating of Least Concern (LC) is suggested.

Representative specimens

COLOMBIA. **Cundinamarca:** Bogota, *CIAT s.n.* (K). COSTA RICA. without exact locality, collected between 1846-1848, *Oersted, A.S. s.n.* (BM, K, NY). **Guanacaste**: P.N. Santa Rosa, de bahía Salinas a Santa Cecilia, Laguna Escondida, 10º 51' N, 85º 38' W, 300 m, 22-VIII-1995, *Espinoza, Roberto 1353A* (K). **Gulf of Honda**: 9º 28' N, 84º 03' W, *Oersted, A.S. s.n.* (K, MEXU); 9º 54' N, 83º 47' W, *Oersted, A.S. s.n.* (K, MEXU). CUBA. **Pinal de Río**: Vuelta de Abajo, 22º 25'03'' N, 83º 41'53'' W, *de la Sagra, R. s.n.* (P). ECUADOR. **Loja**: Celica-Catacocha, km 7, via Empalme, 4º 08' S, 79º 55' W, 1780 m, 8-III-1997, *Lewis, G.P. 3069* (K). EL SALVADOR. **San Salvador**: 2 km southwest of La Libertad, 150 m, 15-VIII-1938, *Worth C.R. 8840* (G, K, MEXU). GUATEMALA. Cerro de la Olla, cerca de Chalupa (El Salvador), *Calderón, S. 977* (NY, US). HONDURAS. **Valle**: On the lower southern slopes of Isla Zacate Grande about 1.5 km west of the small village of Coyolito on the coastal track running west towards Punta Novillo, 13º 19' N, 87º 38' W, 60 m, 26-X-1988, *Hawkins, J. 3* (K). JAMAICA. [Westermoreland] Amity, 1º 15'80'' N, 78º 06' W, 58 m, 1730, *Houston s.n.* (BM). **Arntally**: VIII-1927, *Orcutt, C.R. 2782* (G). **Blue Mountains**: 18º 00' N, 76º 40' W, 6-IV-1916, *Perkins, J.R. 1027* (G). **Mona Island**: Above Hope River, 1 m E of Mona Heights, 18º 03' N, 76º 45' W, 120 m, 13-X-1957, *Yuncker, T.G. 17049* (G). **Parish of Saint Andrew**: Papine to Irish Town, 18º 01' N, 76º 44' W, 476 m, 3-VIII-1960, *Adams, C.D. 7739* (BM); Green River crossing, below Mavis Bank, 18º 02' N, 76º 40' W, 669 m, 16-VII-1926, *Maxon, W.R. 10264* (BM). **Parish of Saint Catherine**: Hope, 18º 01' 61'' N, 77º 01' W, 150 m, 6-I-1898, *Harris, W. 6965 (660).* MEXICO. **Chiapas**: 4 km al N de la desviación a Apitpac, carr. Ocozocoautla-Cintalapa, 16º 46' N, 93º 22' W, 830 m, 12-VIII-1985, *Espejo Serna, A. 2062* (MEXU); Terracería de Arriaga-Col. 20 de Nov, 16º 16'42'' N, 93º 50'46'' W, 233 m, 9-VI-2002, *Reyes-García, A. 5073* (BM, MEXU). **Durango**: El Cinco, 10 km al NE de Toyaltita, 24º 11' N, 105º 57' W, 1530 m, 8-VII-1984, *Tenorio, P. 6303* (MEXU). **Guerrero**: Acapulco, Bahia de, 16º 50' N, 99º 53' W, 130 m, 20-I-1955, *Carlson, M. 3070* (MEXU); Cuatepec, Costa Chica, San Agustín Cuilutla,, 17º 46' N, 99º 46' W, 28-XI-1985, *Herrera Castro, N. 46* (FCME, MEXU); San Luis, Boca, 17º 14' N, 100º 54' W, 25-II-1899, *Langlasse 925* (G, K, MEXU). **Jalisco**: Río Horcones, 27 km S Puerto, Gorge of the Rio Horcones, about 27 km by road south from Puerto Vallarta, 400 m, 4-XI- 1971, *Jennie V.A. Dieterle 4059* (MEXU). **Nayarit**: 3 km al E del Cora, terracería al Cuarenteño, 29-III-1987, *Téllez, O. 10054* (K, MEXU). **Oaxaca**: Sierra Sur, 6 km al SE de El Camarón, San Carlos Yautepec, 16º 30' N, 96º 06' W, 920 m, 8-VII-1987, *Acosta, S. 729* (MEXU); Huatulco, Bahía de, Punta San Agustín, 15º 45' N, 96º 08' W, 10 m, *Castillo C., G. 9765* (MEXU). **Puebla**: Matamoros, 18º 36' N, 98º 28' W, 27-VI-1942, *Miranda, F. 2152* (K, MEXU). **Veracruz**: Puente Nacional, 19º 20' N, 96º 26' W, 150 m, 18-IX-1974, *Ventura, F. 10567* (ENCB, MEXU). NICARAGUA. **Managua**: 12º 10' 08'' N, 86º 02' 05'' W, 43 m, 1887, *Oersted, A.S. s.n.* (K); 12º 09' 30'' N, 86º 16' 06'' W, 75 m, 1887, *Oersted, A.S. s.n.* (K). PERU. **Amazonas**: 14 km NW of Pedro Ruíz, Rd Bagua, in the deep cut Valley of the Rio Utcubamba, 5º 52'06'' S, 78º 11'40'' W, 1100 m, 15-II-2001, *Hughes, C.E. 2034* (FHO, K). VENEZUELA. **Aragua**: Redoma de Tejerías, 10º 15' N, 67º 10' W, 489 m, 5-V-1968, *Cárdenas de G., L. 376* (NY). **Maracay**: 10º 15' N, 67º 36' W, 547 m, *Vogl Pater, C. 552* (M). **Zulía**: Jardín Botánico de Maracaibo, 10º 37' 54'' N, 71º 38' 26'' W, 2 m, 1900, *Bunting, G.S. 6594* (NY).

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