

Barranca de Consoquitla, *Liebmann*, no. 108 (hb. Gr.). GUATEMALA: Valley of Guatemala, *Hartweg* (hb. Gr.); alt. 1550 m., *J. D. Smith*, no. 2363 (hb. Gr.); Volcan de Fuego, alt. 1550 m., *J. D. Smith*, no. 2856 (hb. Gr.); Canizal alt. 1550 m., *Heyde & Lux*, no. 4202 of *J. D. Smith's* distrib. (hb. Gr.). YUCATAN: Merida, *Valdez*, no. 10; without locality, *Gaumer*, no. 397. HONDURAS: San Pedro Sula, alt. 250 m., *Thieme*, no. 5236 of *J. D. Smith's* distrib. (hb. Gr.); Gulf of Fonseca, *Sinclair* (hb. Gr.). COSTA RICA: Cartago, *Cooper*, no. 5810 of *J. D. Smith's* distrib.; in woods near Terraba, alt. 260 m., *Pittier*, no. 3705 (hb. Gr.). PANAMA: Veraguas, *Seemann* (hb. Gr.).

16. *T. Wrightii*, n. sp. A much-branched shrub; branchlets sub-appressed-pubescent: leaves lanceolate, 1.5 to 7 cm. long, 0.5 to 2 cm. broad, entire or inconspicuously denticulate, narrowed below into a sessile or subsessile base, more or less decurrent on the stem, thickish, appressed-puberulent on both surfaces to essentially glabrous, reticulate-veiny beneath: heads about 1.5 cm. high, loosely disposed in corymbose panicles, 11-13-flowered; bracts of the outer involucre spatulate to obovate, 5 to 10 mm. long, 2 to 6 mm. broad; inner involucre of 8 appressed-pubescent scales 10 to 11 mm. in length. — SINALOA: near Mazatlan, January, 1889, *W. G. Wright*, no. 1224 (hb. Gr.), December, 1894, *Lamb*, no. 248 (hb. Gr.). TRES MARIAS ISLANDS: Maria Madre Island, 3 to 25 May, 1897, *Nelson*, no. 4191 (hb. Gr.).

III. — REVISION OF THE MEXICAN AND CENTRAL AMERICAN SPECIES OF HIERACIUM.

B. L. ROBINSON AND J. M. GREENMAN.

THROUGH a lack of accurate knowledge of the Mexican Hawkweeds there has been for many years a tendency to crowd unlike forms into certain of the older and vaguely characterized species. Some years ago the writers made a preliminary revision of the Mexican and Central American species of this genus, but from the uncertainty which still obscured the exact application of some of the earlier specific names, it seemed best to withhold the paper from publication pending further investigation. Of late, however, it has been possible to gain considerable new light on the subject, first from numerous specimens, tracings, drawings, and authentic fragments obtained by the Gray Herbarium through the purchase of the collection of the late Dr. F. W. Klatt, and second

= 1888 on M.B.G. specimen

note: = 348 in Hb. M.B.G.

from some recently secured tracings and fragments of Lessing's species preserved in the Royal Botanical Museum, at Berlin. From these new sources and a very full suite of excellent modern specimens collected by Messrs. Pringle, Palmer, Nelson, L. C. Smith, Conzatti, González, Rose, Pittier, Brandegee, and others, it is now possible to offer the following synopsis with a reasonable confidence that it will prove a useful basis for further work in its particular field. For the sake of comparison a few species, which are at present known only in the southwestern United States but are likely to extend within the boundaries of Mexico, are here included.

HIERACIUM, TOURN. (Name from *ἱεράξ*, a hawk.) — A large and in Europe exceedingly difficult genus. The Mexican and Central American species erect perennial herbs with scapiform or leafy stems, alternate lance-linear to oblong or obovate, dentate or entire pinnately veined leaves and corymbose or paniculate heads; involucrel bracts unequal, narrow, unaltered after anthesis, usually pubescent to bristly hirsute dorsally: corollas orange to lemon yellow, greenish white or rarely flesh-colored: achenes slender and cylindrical or attenuate from near the base toward the summit; pappus copious, bright white to sordid, tawny, or rufous, of simple subequal bristles. — Inst. 469, t. 267 (1700); L. Syst. (1735), & Spec. 799 (1753); Fries, Symbol. Hierac. (1848), & Epicrisis Hierac. (1862); Sch. Bip. Ueber die Hieracien Amerika's, Bonplandia, ix. 172 (1861); Benth. & Hook. f. Gen. Pl. ii. 516 (1873); Hemsl. Biol. Cent.-Am. Bot. ii. 259 (1881); Arvet-Touvet, Spicilegium Hierac. (1881), Rev. des Épervières & Elerchus, Ann. Conserv. Genève. i. 68 (1897); Gray, Proc. Am. Acad. xix. 65 (1884), & Syn. Fl. i. pt. 2, 424 (1884); Peter in Engl. & Prantl, Nat. Pflanzenf. iv. Ab. 5, 375 (1894); Hook. f. & Jacks. Ind. Kew. i. 1149 (1893), which see for generic synonymy.

* Pubescence of the leaves scanty to very copious, sometimes silky or hirsute, but not woolly or matted.

† Achenes fully 5 mm. in length, conspicuously tapering almost from the base to the summit.

1. **H. Fendleri, SCH. BIP.** Stems 1 to 3, erect, 26 to 52 cm. high, hirsute with long fine widely spreading or slightly reflexed bristles, or glabrate: basal leaves 3 to 14, oblanceolate to obovate, acute to rounded and apiculate at the apex, cuspidate-serrulate, attenuate below, 5 to 12 cm. long, 17 to 60 mm. broad, covered on both surfaces and at the margin with long sparse hairs (bronze color in dried specimens); cauline leaves

1 or 2, much smaller, lance-oblong, acute: heads 3 to 40, rather large: inner scales of the involucre 10 to 12 mm. long: achenes at length reddish black; pappus sordid white. — *Bonplandia*, ix. 173 (1861); Gray, Proc. Am. Acad. xix. 69, & Syn. Fl. i. pt. 2, 429, including the poorly marked var. *discolor*. *H. nigrocollinum*, Wats. Proc. Am. Acad. xxv. 133 (1890). *Crepis ambigua*, Gray, Pl. Fendl. 114 (1848), & Pl. Wright, ii. 106 (not i. 129). — NEW MEXICO: banks of Santa Fe Creek, *Fendler*, no. 488 (hb. Gr.); Organ Mountains, *Wright*, no. 1427 (hb. Gr.); Mogollon Mountains, *G. R. Vasey*. ARIZONA: Santa Rita Mountains, alt. 1825 to 2450 m., *Pringle* (hb. Gr.); Tanner's Cañon near Ft. Huachuca, *Lemmon*, no. 2804 (hb. Gr.); Willow Spring, *Palmer*, no. 532 (hb. Gr.); vicinity of Flagstaff, *MacDougal*, no. 19 (hb. Gr.). CHIHUAHUA: Sierra Madre, *Pringle*, no. 1536 (hb. Gr.); pine forest near Chuchichupa, *Hartman*, no. 698 (hb. Gr.); near Colonia Garcia, *Townsend & Barber*, no. 23 (hb. Gr.). LOWER CALIFORNIA: La Chuparosa, *Brandege* (hb. Gr.). Extending northward to Dakota.

2. *H. brevopilum*, GREENE. Stem erect, 47 cm. high, leafy only near the base, pilose with slender spreading or slightly reflexed hairs: leaves narrowly oblong, rounded to acute at the apex, remotely and obscurely glandular-denticulate, pilose upon both surfaces: heads about 8, subracemose; peduncles and long narrow involucre scales glandular-hispid: corollas greenish yellow: achenes dark red; pappus white or nearly so. — Bull. Torr. Club, ix. 64 (1882). *H. Fendleri*, var. *mogollense*, Gray, Proc. Am. Acad. xix. 69 (1884), & Syn. Fl. i. pt. 2, 429. *H. erythrospermum*, Greene acc. to Gray, ll. cc. — NEW MEXICO: Mogollon Mountains, *Rusby* (hb. Gr.).

3. *H. prionophilum*, n. sp. Stem stout, erect, green, striate, 12 dm. high, leafy, covered with long spreading hairs (tawny in dried specimens): basal leaves wanting at anthesis, the cauline about 7, thin, oblong-lanceolate, acutish, strongly dentate, sparsely hirsute upon both surfaces, scarcely paler beneath, 10 to 18 cm. long, 2 to 5 cm. broad, the uppermost reduced, caudate-attenuate: corymbose panicle about 50-headed; its branches curved upwards, tapering; pedicels slender, spreading, tomentulose and covered with minute spreading dark glandular bristles: corollas greenish white: achenes reddish black; pappus bright white. — CHIHUAHUA: shaded ledges, Arroyo Aucho, Sierra Madre, *Pringle*, no. 1314 (hb. Gr.). SAN LUIS POTOSI: alt. 1825 to 2450 m., *Parry & Palmer*, no. 551 (hb. Gr.).

+ + Achenes 3.5 to 4.5 mm. long, columnar or very gradually attenuate toward the summit.

+ + Cauline leaves none, the basal rosulate, very short.

4. *H. junceum*, FRIES. Stem filiform, 13 to 22 cm. high, loosely 1-several-branched: basal leaves sessile, obovate, hirsute upon both surfaces, obtuse: heads 3 to 5, few-flowered, on elongated flocculent-pubescent peduncles; involucre slender, the inner scales elongated, linear, with a few dorsal glanduliferous hairs: achenes long and slender, brownish black, not conspicuously attenuate; pappus reddish white. — Symbol. Hierac. 144 (1848), & Epicris. Hierac. 149; Hemsl. Biol. Cent.-Am. Bot. ii. 259. — OAXACA: in pine woods, Cambre de Ixlepec, alt. 3300 m., *Liebmann* (sketch in hb. Gr.).

Var. *angustifolium*, FRIES. Leaves narrower: achenes more evidently attenuated. — Epicris. Hierac. 149 (1862). — "Sierra de Moucayo" (hb. Martius, acc. to Fries, l. c.). Not seen.

+ + Cauline leaves present, lance-linear, entire, 12 times as long as wide.

= Peduncles glabrous or sparingly hispid.

5. *H. carneum*, GREENE. Stem nearly or quite glabrous from the base, glaucous, branched from the middle: basal leaves elliptical, sessile, thickish, densely covered with long white hairs (rufous in dried specimens); stem-leaves long and relatively narrow, acute, nearly or quite glabrous: involucre scales green and glabrous: corollas deep flesh-colored. — Bot. Gaz. vi. 184 (1881); Gray, Proc. Am. Acad. xix. 69, & Syn. Fl. i. pt. 2, 430. — NEW MEXICO: oak woods, south base of Pinos Altos Mountains, *Greene* (hb. Gr.).

Var. *chihuahuense*, n. var. Basal leaves attenuate below to a narrow petiole-like base; lower cauline leaves, peduncles, and involucre scales sparingly pubescent: corollas white. — CHIHUAHUA: foothills of the Sierra Madre, *Pringle*, no. 1315 (hb. Gr.); near Colonia Garcia in the Sierra Madre, *Nelson*, no. 6192 (hb. U. S. Nat. Mus.).

= = Peduncles tomentulose.

6. *H. prionobium*, n. sp. Stems 1 to 3, erect, 6 to 8 dm. high, covered below with rather copious spreading or slightly deflexed hairs: basal leaves spatulate or oblanceolate, 15 to 20 cm. long, 10 to 25 mm. wide, obscurely denticulate, rounded at the apex, erect, hairy on both surfaces; the cauline leaves lance-linear, sessile, acute, essentially entire, 6 to 20 cm long, 3 to 15 mm. broad, sparingly pubescent: heads about 12, in an open loose corymbose panicle; peduncles curved-ascending, 1

to 3 cm. long, finely tomentulose and setulose; heads narrowly campanulate, about 30-flowered; scales of the involucre about 14, linear, acute, nigrescent, dorsally hirtellous and glanduliferous, the inner 8 mm. long: corollas yellow: achenes reddish brown, very slightly attenuate, 4 mm. long; pappus pure white. — CHIHUAHUA: shaded slopes of the Sierra Madre, 18 September, 1887, *Pringle*, no. 1313 (hb. Gr.), distributed as *H. Schultzii*; ? near Colonia Garcia, alt. 2,280 m., *Townsend & Barber*, no. 254 (hb. Gr.), distributed as *H. Rusbyi*, immature and doubtful; in the Sierra Madre, *Nelson*, no. 6128 (hb. U. S. Nat. Mus.).

++ ++ ++ Cauline leaves oblong, broadly cordate at the sessile clasping base, 2 to 8 times as long as broad.

7. *H. crepidispermum*, FRIES. Stem usually solitary, erect, 3 to 5 dm. high, covered with long slender widely spreading hairs (becoming bronze color after drying): basal leaves narrowly obovate, 4 to 13 cm. long, 15 to 35 mm. broad, rounded, or obtuse at the apex, cuspidate-denticulate, loosely villous on both surfaces, especially upon the midnerve beneath; cauline leaves 3 to 8, oblong, acute, 2 to 4 cm. broad, cordate-clasping at the often but slightly narrowed base: heads 7 to 40, at first crowded, later in an open corymb; peduncles tomentulose and covered with short dark glandular bristles: achenes reddish black, 3.5 to 4 mm. long, slightly attenuated toward the base as well as toward the summit; pappus bright white. — Symb. Hierac. 146 (1848), & Epicris. Hierac. 152; Wats. Proc. Am. Acad. xviii. 110; Gray, Proc. Am. Acad. xix. 70; Hemsl. Biol. Cent.-Am. Bot. ii. 259. *Crepis stenotheca*, Fries, Symb. Hierac. 146 (1848). *Heteropleura crepidisperma*, Sch. Bip. Flora, xlv. 435 (1862). *H. tolucanum*, Arv.-Touv. Ann. Conserv. Genève. i. 92 (1897). — COAHUILA: east and south of Saltillo, *Palmer*, no. 758 (coll. of 1880), hb. Gr. DURANGO: Real del Monte, *Ehrenberg*, acc. to Sch. Bip., l. c. TERRITORY OF TEPIC: near Santa Teresa, *Rose*, nos. 3405, 2080 in part (hb. U. S. Nat. Mus.). STATE OF MEXICO: hillsides, valley of Toluca, *Pringle*, no. 4183 (hb. Gr.); *Holway*, no. 3204 (hb. Gr.); pine woods, Eslava, valley of Mexico, alt. 2400 m., *Pringle*, no. 9364 (hb. Gr.). PUEBLA: pine woods, Chinantla, *Liebmann* (type, sketch in hb. Gr.); hills near Amozoc, alt. 2700 m., *Pringle*, no. 9360 (hb. Gr.). MORELOS: Popocatepec, alt. 2700 m., *Schaffner*, acc. to Sch. Bip., l. c. VERA CRUZ: Mt. Orizaba, alt. 3000 m., *Seaton*, no. 181 (hb. Gr.); Mirador, *Liebmann*, no. 447 (sketch in hb. Gr.). OAXACA: Sierra de las Cruces, alt. 2560 m., *Schaffner*, acc. to Sch. Bip., l. c.; west slope of Mt. Zempoaltepec, alt. 2325 to 2420 m., *Nelson*, no. 567 (hb. Gr.).

The material at hand shows conclusively the inconstancy of the characters upon which *H. tolucanum* was founded.

8. *H. Lemmoni*, GRAY. Habit, stature, and foliage as in the preceding; inflorescence thyrsoidal; peduncles tomentulose, without dark hairs — Proc. Am. Acad. xix. 70 (1883), & Syn. Fl. i. pt. 2, 430. — ARIZONA: Bear Spring, Cave Cañon, *Lemmon*, no. 2803 (hb. Gr.); Santa Rita Mountains, *Pringle* (hb. Gr.). Doubtfully distinct from the preceding.

9. *H. Rosei*, n. sp. Perennial, about 5 dm. tall, branched from below the middle; stem purple, densely spreading-hirsute with long grayish slightly deflexed hairs: leaves about 5, chiefly cauline, 5 to 6 cm. long, about half as broad, ovate-oblong, obtuse, undulate and (often obsoletely) cuspidate-denticulate, sparsely villous, somewhat paler beneath: panicle lax, the lower branches long and naked from the axils of ovate-oblong obtuse foliaceous bracts; pedicels filiform, pale-tomentulose, hispidulous; heads about fifty; involucre narrowly campanulate, 8 to 9 mm. long, nigrescent, externally subappressed-pubescent: achenes purplish black, slender, slightly tapering upwards, 4 to 4.5 mm. long; pappus white, becoming sordid. — TEPIC: in the Sierra Madre between Santa Gertrudis and Santa Teresa, 8 August, 1897, *Dr. J. N. Rose*, no. 2080, in part (hb. U. S. Nat. Mus., tracing and fragments in hb. Gr.). Readily distinguished from the related species by its short and broad leaves.

+++ Achenes 2 to 3 mm. long.

++ Stems decidedly leafy; leaves large (8 to 12 cm. long).

10. *H. Rusbyi*, GREENE. Stem erect, 3-4-leaved, 6 dm. high, covered to the middle with spreading villous pubescence, nearly glabrous above; leaves lance-oblong, nearly entire, villous upon both surfaces, acute, the cauline sessile by broad amplexicaul base: branches of the loosely corymbose inflorescence minutely flocculent-tomentose, neither they nor the pale bracts (12 to 14 in number) of the narrow cylindrical involucre hispid: heads about 23-flowered. — NEW MEXICO: Mogollan Mountains, *Rusby* (hb. Gr.). CHIHUAHUA: about 64 km. from Guadalupe y Calvo, alt. 2450 m., *Nelson*, no. 4816 (hb. U. S. Nat. Mus.), Mt. Mohinora, *Nelson*, no. 4897 (hb. U. S. Nat. Mus.).

11. *H. Wrightii*, n. comb. Stem tall and stout, fistulose, 4 to 9 dm. high, very hirsute to the summit, 5-9-leaved; caudex stout, comose: basal leaves oblanceolate, narrowed to a long petiolar base, glaucescent, obsoletely glandular-denticulate, villous-hirsute upon both surfaces; cauline leaves lance-oblong, attenuate: panicle many-headed; the peduncles

somewhat rigid, hispidulous; involucre campanulate, in fruit nearly 1 cm. broad, the scales tomentulose and covered with long spreading tawny or darker colored glandular setae: corollas yellow: achenes columnar, nearly black, striate, glabrous, 2 to 2.5 mm. long; pappus bright white or slightly tawny. — *H. Rusbyi*, var. *Wrightii*, Gray, Proc. Am. Acad. xix. 68 (1883), & Syn. Fl. i. pt. 2, 428. *Crepis ambigua*, Gray, Pl. Wright, i. 129 (1852), not of Pl. Fendl. *H. mexicanum*, Gray, Proc. Am. Acad. xix. 70 (1883), in part, not Less. *H. mexicanum*, var. *niveopappum*, Gray in Wats. Proc. Am. Acad. xviii. 110 (1883). — WESTERN TEXAS: between the Limpio and Rio Grande rivers, *Wright* (hb. Gr.). COAHUILA: Sierra Madre south of Saltillo, *Palmer*, no. 757 (coll. of 1880), hb. Gr., doubtful. CHIHUAHUA: hills near Chihuahua, *Pringle*, nos. 592, 771 (both in hb. Gr.). LOWER CALIFORNIA: Saucito, *Brandege* (hb. Gr.). SAN LUIS POTOSI: in shady places near the city, *Schaffner*, nos. 287, 288 (both in hb. Gr.); *Parry & Palmer*, nos. 552, 553 (in both hb. Gr.). DURANGO: among hills, *Palmer*, no. 653 (coll. of 1896), hb. Gr.

12. *H. abscissum*, LESS. Stem 5 to 9 dm. high, hirsute, especially below the middle: basal leaves oblanceolate, obtuse and mucronate or acute, slightly paler beneath, including the long gradually narrowed petiolar portion 17 cm. in length, hairy upon both surfaces, rarely subglabrous, cuspidate-denticulate to subsinuate-dentate; cauline leaves about 4, thin, oblong-lanceolate, the lower attenuate at the base, the upper somewhat cordate-clasping: inflorescence at first thyrsoidal but at length open and 3 to 4 dm. long; heads small, about 26-flowered, slender-peduncled: achenes 2 mm. long; pappus sordid. — *Linnaea*, v. 132 (1830); *Fries*, Symbol. Hierac. 148 (where the achenes are incorrectly described as elongated), & *Epicris*. Hierac. 150 (excluding the indefinite references to plants of the southern United States); Gray, Proc. Am. Acad. xix. 70, & Syn. Fl. i. pt. 2, 430; *Hemsl.* Biol. Cent.-Am. Bot. ii. 259. *H. strigosum*, Don, Trans. Linn. Soc. xvi. 175 (1830), ex char.; *Arv.-Touv.* Spicileg. Hierac. 7. *H. Schaffneri*, Sch. Bip. acc. to *Arv. Touv.* l. c. *H. thyrsoides spectabile*, *Fries*, Symbol. Hierac. 141 (1848). *H. Friesii*, Sch. Bip. Bonplandia, ix. 174, 326 (1861), not Hart. *H. Schultzii*, *Fries*, *Epicris*. Hierac. 150 (1862). — NUEVO LEON: on the Sierra Madre, *Pringle*, nos. 2205, 2838 (both in hb. Gr.). SAN LUIS POTOSI: grassy hillsides, Las Canvas, *Pringle*, no. 5077 (hb. Gr.). TERRITORY OF TEPIC: between Dolores and Santa Gertrudis, *Rose* (hb. U. S. Nat. Mus.). HIDALGO: Real del Monte, *Coulter* (hb. Gr.). STATE OF MEXICO: near Tacubaya, *Schaffner*,

no. 66 (hb. Gr.); pine woods near Eslava, alt. 2420 m., *Pringle*, no. 9363 (hb. Gr.). MICHOACAN: hills, Patzcuaro, *Pringle*, no. 5270 (hb. Gr.). MORELOS: mountain woods above Cuernavaca, alt. 2260 m., *Pringle*, no. 8053 (hb. Gr.). VERA CRUZ: near Orizaba, *Bourgeau*, no. 2800 (hb. Gr.); Volcano Tuxtla, alt. 600 to 1450 m., *Nelson*, no. 462 (hb. Gr.); Orizaba, *Botteri*, no. 144 (hb. Gr.). PUEBLA: Mount Popocatepetl, alt. 3000 m., *Schaffner*, no. 68 (hb. Gr.). OAXACA: Sierra de San Felipe, alt. 6000 m., *Conzatti & González*, no. 695 (hb. Gr.); Sierra de San Felipe del Agua, alt. 695 m., *Conzatti & González*, no. 401, in part (hb. Gr.); Oaxaca, *Conzatti & González*, alt. 525 m., no. 1004 (hb. Gr.). CHIAPAS: *Ghiesbreght*, nos. 20, 574 (in both hb. Gr.); near San Cristobal, alt. 2100 to 2660 m., *Nelson*, no. 3225 (hb. U. S. Nat. Mus.). GUATEMALA: Department of Santa Rosa, alt. 750 m., *Heyde & Lux*, no. 3784 (of J. D. Smith's distrib.).

13. *H. anthurum*, FRIES. Very tall; stem-leaves linear, the lower attenuate into a petiole, the upper sessile: inflorescence becoming 6 dm. long; involucre very hirsute with dark glandular hairs; pappus reddish. — Symbol. Hierac. 153 (1848), & Epicris. Hierac. 157; Hemsl. Biol. Cent.-Am. Bot. ii. 259. — OAXACA: Sierra de Zempoaltepec, *Liebmann*. Not seen; characters compiled.

++ Stem-leaves 0 to 3, rarely over 7 cm. long.

14. *H. comatum*, FRIES. Leafy and sericeous at the base; stem leafy and strongly hirsute near the base, 4 to 6 dm. high, subglabrous above: leaves oblong-lanceolate, hirsute upon both surfaces, thickish, much paler and glaucous beneath; the lower cauline and radical obtuse or rounded, cuspidate-denticulate, the upper lance-linear, attenuate: heads loosely paniculate, small; peduncles spreading, filiform, canescent-tomentulose, finely glandular-pubescent. — Symbol. Hierac. 148 (1848), including var. *irregulare*, a much branched narrow-leaved form, & Epicris. Hierac. 152; Hemsl. Biol. Cent.-Am. Bot. ii. 259. — PUEBLA: in pine woods at Chinantla, alt. 2100 to 2400 m., *Liebmann* (sketch in hb. Gr.); near Calchicomula, *Rose & Hay*, no. 5806 (hb. U. S. Nat. Mus.). OAXACA: Sierra de San Felipe, grassy wooded slopes, alt. 2400 m., *Pringle*, no. 4701 (hb. Gr.), dry ridges under pines, alt. 2560 to 3000 m., *Pringle*, no. 4708 (hb. Gr.), alt. 2860 to 3300 m., *Nelson*, no. 1077 (hb. U. S. Nat. Mus.); Sierra de San Felipe del Agua, alt. 2300 m., *Conzatti & González*, no. 401, in part (hb. Gr.); west slope of Mount Zempoaltepec, alt. 2300 to 2410 m., *Nelson*, no. 593 (hb. Gr.).

15. *H. oaxacatum*, n. sp. Caudex hairy at the oblique summit,

elongated, sending off tough simple roots; stem simple, 2 to 5 dm. high, flexuous, covered throughout with long spreading hairs: basal leaves 2 to 3, oblong-lanceolate, rounded and apiculate at the apex, narrowed at the base, 3 to 5 cm. long, 10 to 16 mm. broad, hirsute upon both surfaces, paler beneath, glandular-denticulate: petioles nearly as long; cauline leaves about 3, somewhat remote, oblong or oblanceolate, obtusish to acute, denticulate, somewhat narrowed toward the sub-clasping base: heads about 3; peduncles densely tomentose and bristly with glandular hairs; involucre scales dark colored, attenuate, glandular-pubescent, in fruit 1 cm. long: corollas apparently white or very light yellow: achenes reddish black, columnar, 3 mm. long; pappus in dried specimens sordid white.—STATE OF MEXICO: valley of Mexico, *Bourgeau*, no. 384 (hb. Gr.), *Schaffner*, no. 309 (hb. Gr.). OAXACA: Sierra de San Felipe, alt. 3000 m., *Pringle*, no. 4715 (hb. Gr.), type. Distinguished from the preceding by its fewer larger heads, and by the stem, which is setose to the summit with hairs 2 mm. long.

16. *H. mexicanum*, LESS. Stems 1 to several, slender, 2 to 5 dm. high, flexuous, sometimes branched, more or less hairy toward the base, glabrous (to the unassisted vision) above or very finely tomentulose, never setose; caudex woolly-tufted at its summit: leaves essentially confined to a basal rosette, thickish, oblong-lanceolate, obtuse to acute, including the narrowed petiolar base 3 to 7 cm. long, 1 to 1.5 cm. broad, more or less villous-pubescent upon both surfaces, much paler beneath, glandular-denticulate; cauline leaves none or 1 or 2, much reduced, oblong-linear, acute: heads 3 to 10 to (rarely) 26, narrow, about 20-flowered; involucre scales dark colored, narrow, from smoothish to tomentulose and minutely bristly-glandular: achenes 2 to 3 mm. long.—*Linnaea*, v. 133 (1830); *Fries*, *Symbol. Hierac.* 139, & *Epicris. Hierac.* 149; *Gray*, *Proc. Am. Acad.* xix. 70, in part; *Hemsl. Biol. Cent.-Am. Bot.* ii. 260. ? *H. Lagopus*, *Don*, *Trans. Linn. Soc.* xvi. 176 (1830); *Fries*, *Epicris. Hierac.* 143. *H. niveopappum*, *Fries*, *Symbol. Hierac.* 139 (1848). *H. thyrsoides plebejum*, *Fries*, *Symbol. Hierac.* 142 (1848). *H. praemorsiforme*, *Sch. Bip. Bonplandia*, ix. 174, 327 (1861). *H. multicaule*, *Schaffner* acc. to *Sch. Bip. Bonplandia*, ix. 173 (1861); *Fries*, *Epicris. Hierac.* 149 (1862). *H. orizabaeum*, *Arv.-Touv. Spicileg. Hierac.* 17 (1881), ex char. *H. intybiformia*, *Arv.-Touv. Ann. Conserv. Genève.* 95 (1897).—JALISCO: between Huejuquilla and Mesquitec, *Rose* (hb. U. S. Nat. Mus.). STATE OF MEXICO: San Angel, alt. 2440 m., *Schaffner* (hb. Gr.); Sierra de las Cruces, alt. 2600 m., *Schaffner*, *Pringle*, no. 5322 (hb. Gr.); dry pine woods Nevada de

Toluca, alt. 2900 m., *Pringle*, no. 4284 (hb. Gr.). PUEBLA : Popocatepetl, *Schaffner*, no. 67 (hb. Gr.). VERA CRUZ : Mt. Orizaba, *Schiede*, no. 285 (hb. Gr.), type; alt. 3950 m., *Liebmann* (sketch in hb. Gr.); alt. 3050 m., *Galeotti*, no. 2173 (hb. Gr.); *Seaton*, no. 182 (hb. Gr.); *Rose & Hay*, nos. 5750, 5751 (hb. U. S. Nat. Mus.). GUERRERO : between Tixtla and Chilpancingo, alt. 1820 to 2140 m., *Nelson* (hb. U. S. Nat. Mus.); top of Sierra Madre near Chilpancingo, alt. 2750 to 3180 m., *Nelson*, no. 2192 (hb. U. S. Nat. Mus.). OAXACA : summit of Mt. Zempoaltepec, alt. 3475 m., *Nelson*, no. 634 (hb. U. S. Nat. Mus.).

17. *H. irasuense*, BENTH. Near *H. mexicanum* but with a stem less tall and seldom branched, covered throughout by a dark bristly glandular pubescence as well as by a fine short and sordid tomentum: leaves longer, 3 to 13 cm. in length, 1 to 2 cm. broad, subentire or conspicuously glandular-dentate: heads 10 to 15, crowded. — Benth. in Oerst. Vidensk. Meddel. 1852, p. 113; Fries, *Epicris. Hierac.* 144. Referred by Hemsl. l. c. 259 to *H. lagopus*, Don. — COSTA RICA : on the Volcano Irazu, alt. 2925 m., *Oersted*; also at Laguna del Reventado, alt. 2300 m., 1 January, 1901, *H. Pittier*, no. 14,074 (hb. Gr.).

* * Pubescence on both surfaces of the leaves long, truly woolly, of matted or felted hairs.

18. *H. Pringlei*, GRAY. Stem 34 to 68 cm. high, woolly toward the base: leaves chiefly basal, rosulate and decumbent upon the ground, obovate to oblanceolate, 7 to 10 cm. long, 20 to 35 mm. wide, obscurely cuspidate-denticulate: heads 12 to 18, in an open corymb; involucre in fruit 1 cm. long, involved in close wool through which short light-colored bristles protrude: achenes columnar, reddish brown, 3 mm. long; pappus essentially white. — Proc. Am. Acad. xix. 69 (1883), & Syn. Fl. i. pt. 2, 429; Arv.-Touv. Ann. Conserv. Genève. i. 96. — SOUTHERN ARIZONA : Santa Rita Mountains, 6 May, 1881, *Pringle*, no. 314 (hb. Gr.), 2 June, 1884, *Pringle* (hb. Gr.), *Lemmon*, no. 369 (hb. Gr.). To be expected in Mexico.

19. *H. jaliscense*, n. sp. Root of strong dark brown fibres; stem subflexuous, 48 to 72 cm. high, simple to the corymbosely branched inflorescence, glabrate above, lanate toward the base, the hairs long, white, widely spreading or somewhat reflexed, matted: basal leaves 2 to 5, oblanceolate, 5 to 15 cm. long, 1.5 to 3 cm. wide, erect, cuspidate-denticulate, rounded or obtuse, often apiculate at the apex; cauline leaves 1 to 3, lanceolate to linear: heads about 10; peduncles bristly

with pale stipitate glands; involucre 8 to 10 mm. long; inner scales narrowly linear, attenuate, glandular, bristly chiefly near the midrib, scarcely at all woolly: achenes columnar, striate, reddish brown, 3 mm. long; pappus slightly tawny. — JALISCO: near Guadalajara, gravelly banks, *Pringle*, no. 5133 (hb. Gr.), hillsides, *Pringle*, no. 2990 (hb. Gr.), dry gravelly banks, *Pringle*, no. 4461 (hb. Gr.). TERRITORY OF TEPIC: between Dolores and Santa Gertrudis, *Rose*, no. 2044 (hb. U. S. Nat. Mus.). STATE OF MEXICO: Sierra de Ajusco, alt. 2440 m., *Pringle*, no. 7211 (hb. Gr.).

Var. *Ghiesbreghtii*, n. var. Pedicels and involucre scales covered with close wool (tawny in dried specimens) as well as stipitate glands: habit, etc., of the typical form. — CHIAPAS: growing in the plains, cool region, *Ghiesbreght*, no. 573 (hb. Gr.).

DOUBTFUL SPECIES.

H. STUPOSUM Fries. Leafy at base, the summit of the caudex woolly; stem 1 to 1.2 dm. high, almost naked, branched, slightly scabrous: radical leaves densely rosulate, petiolate, lanceolate, repand-dentate; the cauline reduced: inflorescence thyrsoidal, clothed with white floccose pubescence; involucre soft-villous: achenes narrowed downward; pappus white. — Vet. Acad. Förh. 1856, p. 146, & *Epicris Hierac.* 148; Hemsl. Biol. Cent.-Am. Bot. ii. 260. — MEXICO: *Ehrenberg*.

H. FRIGIDUM, Wedd. *Chloris*, And. i. 225 (1855); Klatt in Engl. Jahrb. viii. 52. — Klatt, l. c., ascribes this South American species to Guatemala, a report based upon Lehmann's no. 1526, which is not now in the Klatt Herbarium. No specimen from north of Panama has been seen by the writers, which corresponds with the South American plant.

IV. — SYNOPSIS OF THE MEXICAN AND CENTRAL AMERICAN SPECIES OF ALNUS.

By M. L. FERNALD.

SEVERAL Mexican and Central American Alders of very diverse characters have been generally called *A. acuminata* and *A. jorullensis*. This disposition of the forms has been most unsatisfactory, and the following synopsis is offered as a partial solution of the difficulties presented by them.



Robinson, Benjamin Lincoln and Greenman, J. M. 1904. "Revision of the Mexican and Central American species of Hieracium." *Contributions from the Gray Herbarium of Harvard University* (28), 14–24.

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