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### NOTES ON NORTH AMERICAN TREES, IX<sup>1</sup>

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#### NEW SPECIES AND VARIETIES OF CRATAEGUS

##### *Crataegus cherokeensis* (§*Crus-galli*), n. sp.

Leaves oblong-obovate, rounded or acute at apex, gradually narrowed and cuneate at base, finely, often doubly serrate usually only to the middle with acute teeth thickened at apex, glabrous with the exception of a few hairs on the upper side of the midrib early in the season, thin, dark green and lustrous above, paler below, 3.5–4 cm. long, 1.5–2 cm. wide, with a slender midrib and thin obscure primary veins, on vigorous leading shoots usually acute at apex, often acutely lobed above the middle, 4–5 cm. long and 3.5–4 cm. wide; petioles slender, often wing-margined nearly to the base, glabrous, 5–7 or on vigorous shoots up to 10–12 mm. in length. Flowers opening early in April, 10–12 mm. in diameter, on slender glabrous pedicels, in 5–7-flowered globose glabrous corymbs; calyx-tube narrow-obconic, glabrous, the lobes slender, gradually narrowed from the base, long-acuminate, entire or slightly and irregularly toothed above the middle, glabrous; stamens 10, anthers red; styles 1–3, usually 2. Fruit ripening late in September, ellipsoidal, dull orange-red, 10 mm. long, 6–7 mm. thick, the persistent calyx sessile or raised on a short tube; nutlets narrowed and rounded at the ends, only slightly ridged on the back, 6–8 mm. long and 3–5 mm. wide, the narrow hypostyle extending to below the middle.

A small tree with dark slightly scaly bark and slender glabrous often distinctly zigzag branchlets red-brown or orange-brown during their first year, later becoming dark gray-brown, and armed with numerous straight slender spines 3–4 cm. in length.

TEXAS. Cherokee County, upland thickets near Larissa, *E. J. Palmer*, No. 9371 (2), April 7, 1916, type for flowers, No. 10704 (2), September 14, 1916, type for fruit, No. 9372 (2 A), April 7, 1916, (with pink anthers) No. 10705 (2 A), September 14, 1916.

<sup>1</sup>For part VIII see vol. II p. 164.

The narrow oblong-obovate finely serrate leaves and ellipsoidal fruit distinguish this species from *C. Reverchonii* Sargent of the Dallas region of Texas, with nearly orbicular coarsely serrate leaves and smaller globose fruit, the only *Crus-galli* species with glabrous corymbs, 10 stamens and red or pink anthers which has been found before in the Arkansas, western Louisiana and Texas region.

***Crataegus phaneroneura* (§*Crus-galli*), n. sp.**

Leaves oblong-obovate, rounded, acute or abruptly short-pointed at apex, gradually narrowed and cuneate at base, finely often doubly serrate usually only to the middle with straight or slightly incurved teeth callous at apex, glabrous with the exception of a few hairs on the upper side of the midrib early in the season, fully grown when the flowers open, 5–7 cm. long and 2.5–3.5 cm. wide, with a slender midrib and 7–10 pairs of thin conspicuous primary veins; petioles slender, sparingly villose on the upper side early in the season, soon glabrous, 8–10 mm. in length; leaves on vigorous leading shoots rarely elliptic, more coarsely serrate, upper to 9 cm. long and 5 cm. wide. Flowers appearing from the middle to the 20th of May, 1.5 cm. in diameter, in broad loose 10–20-flowered, slightly villose or nearly glabrous corymbs; calyx-tube narrow-obconic, glabrous, the lobes slender, acuminate, entire, glabrous; stamens 5 or 6, anthers cream color; styles 1–3. Fruit ripening the end of September in long-branched drooping few-fruited clusters, subglobose, dull red, 10–12 mm. in diameter, with thin dry flesh, the calyx not enlarged, with a broad shallow cavity rounded in the bottom; nutlets rounded at the broad ends, only slightly ridged on the back, 6–7 mm. long and 5 mm. wide, the narrow hypostyle extending to the middle.

A tree 5–7 m. high, with a trunk 18–20 cm. in diameter, spreading and erect branches forming an open narrow head, and stout nearly straight branchlets covered when they first appear with matted pale hairs, soon glabrous, light reddish brown during their first season, becoming reddish or gray-brown and armed with many stout or slender straight or slightly curved purple or gray spines 5–6 cm. in length.

MISSOURI. Pike County, hillsides, Clarksville, *John Davis*, No. 1466. November 23, 1912, No. 1468, September 23, 1912, No. 1474, May 20 and September 23, 1912 (type), No. 1475, May 20, 1912, with glabrous corymbs and young branches.

This handsome plant is easily distinguished from all related species in the more numerous and conspicuous primary veins of the leaves which are similar in the form with villose corymbs and young branchlets which is here considered the type, and in the glabrous form which when the tree is better known will probably be best considered a distinct variety.



***Crataegus lawrencensis* (§*Crus-galli*), n. sp.**

Leaves oblong-obovate, acute at apex and concave-cuneate at base, or occasionally broad-elliptic and rounded at apex and rarely at base, coarsely often doubly serrate usually only to the middle with broad callus-tipped teeth, and rarely furnished with short lateral lobes, thin, dark yellow-green on the upper surface, pale on the lower surface, glabrous with the exception of a few hairs on the upper side of the midrib, 4–6 cm. long and 2–3.5 cm. wide, and on leading shoots up to 7 cm. long and 4 cm. wide; petioles slender, wing-margined often nearly to the base, slightly villose on the upper side, 1–1.5 cm. in length. Flowers appearing at the end of April, 1.5 cm. in diameter, on slender glabrous pedicels, in 5–10-flowered glabrous corymbs; calyx-tube broad-obconic, glabrous, the lobes gradually or abruptly narrowed from a wide base, slender, long-acuminate, entire or furnished with an occasional tooth, glabrous; stamens about 15; anthers deep rose color; styles 3. Fruit ripening early in October, in slender-branched drooping clusters, subglobose, green tinged with red, about 5 mm. in diameter, the calyx prominent, with a broad shallow cavity; flesh thin, hard and dry; nutlets 3, broad and rounded at the ends, rounded and rarely slightly ridged on the back, about 5 mm. long and 3–5 mm. broad, the narrow hypostyle extending to the middle.

A small tree with irregularly spreading branches, dark brown scaly bark and slender nearly straight chestnut-brown branchlets becoming dark gray-brown in their second year, and sparingly armed with slender straight spines 2.5–3 cm. in length.

MISSOURI. Lawrence County, La Russell, *E. J. Palmer*, No. 1, April 22, and October 10, 1908 (type). Jasper County, Webb City, *E. J. Palmer*, No. 18, April 5, 1903.

***Crataegus limnophila* (§*Crus-galli*), n. sp.**

Leaves oblong-obovate, rounded or acute and often apiculate at apex, gradually narrowed and cuneate at base, finely crenulate-serrate above the middle, glabrous with the exception of a few hairs on the upper side of the midrib early in the season, thin, dark green and lustrous above, pale below, 3.5–4 cm. long, 1–1.5 cm. wide and nearly fully grown when the flowers open; petioles slender, glabrous, slightly wing-margined, 5–6 mm. in length; leaves on vigorous shoots broad-obovate, more coarsely serrate and up to 5 cm. long and 1.5 cm. wide. Flowers opening early in April, about 1 cm. in diameter, on slender pedicels in small compact usually 7 to 10-flowered sparingly villose corymbs; calyx-tube narrow-obconic, glabrous, the lobes slender, short-acuminate, entire, glabrous on the outer surface, villose on the inner surface; stamens 15–20, anthers dark rose color; styles usually 3–5. Fruit ripening the end of September, in few-fruited erect glabrous clusters, ellipsoidal, bright red, 7–9 mm. long and 6 or 7 mm. thick, with thin dry flesh, the calyx little enlarged, with a deep narrow cavity pointed in the bottom; nutlets 3–5, broad and rounded at base, narrowed at apex, about 5 mm. long and 3 or 4 mm. wide, the broad hypostyle expanding nearly to the base.



A tree 8 or 9 m. high with a trunk 18–20 cm. in diameter covered with gray bark divided by shallow fissures, spreading pale ashy gray branches forming a broad round-topped head, and slender branchlets sparingly villose, soon glabrous, and dark red-brown in their first season, becoming lighter in their second year and ultimately gray, and armed with occasional slender straight spines 2.5–3 cm. in length.

FLORIDA. Wakulla County, in the water of deep swamps and in low wet woods near St. Marks, *T. G. Harbison*, Nos. 1206 and 1208, September 25, 1913, No. 1428, March 30, 1914, No. 5692, April 13, 1920 (type), No. 5697, April 14, 1920, with glabrous corymbs and young branchlets.

A plant of the *Crus-galli* Group growing in wet soil has not before been reported. The small flowers in small compact corymbs, the small ellipsoidal fruit and slender branches well distinguish this species. *Crus-galli* species are rare in the coast region of the southeastern states, and from Florida only *C. pyracanthoides* Beadle with 5–10 stamens has been previously described.

***Crataegus sublobulata* (§*Crus-galli*), n. sp.**

Leaves broad-obovate to elliptic, acute or rounded at apex, abruptly or gradually narrowed and cuneate at base, coarsely, deeply and irregularly serrate with acuminate teeth, and often sublobulate with acuminate lobules, tinged with red and covered above with short white hairs deciduous before the flowers open except from the upper side of the midrib, glabrous at maturity, thick, dark green and lustrous on the upper surface, paler on the lower surface, 3.5–4 cm. long, 2.5–3 cm. wide, with a stout midrib and prominent primary veins, or on vigorous shoots often 4–5 cm. long and 3.5 cm. wide; petioles stout, wing-margined often nearly to the middle, grooved and villose-pubescent on the upper side, 1–1.2 cm. or on leading shoots up to 2 cm. in length. Flowers opening late in March and early in April, 1.5 cm. in diameter, on slender glabrous pedicels, in 5- or 6-flowered compact corymbs; calyx-tube narrow-obconic, glabrous, the lobes slender, acuminate, entire or furnished above the middle with occasional slender teeth, glabrous on the outer surface, sparingly villose-pubescent on the inner surface; stamens 20; anthers pink; styles 2–5. Fruit short-oblong to subglobose or rarely to obovoid, orange-red, 8–10 mm. long and 6 or 7 mm. broad; nutlets usually broader at apex than at base, prominently ridged on the back, 5–7 mm. long and 3–5 mm. wide, the broad hypostyle extending to below the middle and often nearly to the base.

A round-topped tree 8–10 m. high, with a short trunk covered with soft corky slightly ridged gray-brown bark, wide-spreading branches and slender slightly zigzag branchlets light reddish brown and glabrous when they first appear, becoming darker during their first season and light gray-brown the following year, and armed with numerous slender straight chestnut-brown lustrous spines, becoming dull gray-brown and 2.5–4 cm. in length.



TEXAS. San Augustine County, borders of upland woods near San Augustine, *E. J. Palmer*, No. 10617 (2), September 17, 1916, No. 13239 (No. 2), April 1, 1918 (type).

The distinct character in this species is the deep serration of the leaves, unusual in plants of the *Crus-galli* Group. From *C. Bushii* Sargent, the species of southern Arkansas, western Louisiana and eastern Texas with 20 stamens and rose-colored anthers it is well distinguished by the shape of the leaves.

*Crataegus intermixta* (§*Crus-galli*), n. sp.

Leaves elliptic to slightly obovate, acute, abruptly short-pointed or rarely rounded at apex, gradually narrowed and cuneate at base, sharply and doubly serrate above the middle with erect acuminate teeth, and on leading shoots occasionally slightly lobed, glabrous, thin, 4–5 cm. long and 2–2.5 cm. wide, with a thin midrib and 4 or 5 pairs of slender prominent primary veins; petioles slender, slightly wing-margined toward the apex, sparingly glandular, 1–1.5 cm. in length. Flowers appearing from the middle to the 20th of May, about 1 cm. in diameter, on slender pedicels, in globose usually 5–10-flowered compact corymbs; calyx-tube broad-obconic, glabrous, the lobes short, gradually narrowed, serrate above the middle with occasional glandular teeth, glabrous on the outer surface, soft-pubescent on the inner surface; stamens 20; anthers pink; styles 1–3. Fruit ripening the end of October, subglobose to slightly obovoid, dark orange-red, 10–12 mm. in diameter, crowned with the only slightly enlarged calyx, with a deep cavity wide in the bottom, and firm hard flesh; nutlets 2–3, rounded at the gradually narrowed ends, about 8 mm. long and 5 mm. wide, with a low broad dorsal ridge; the narrow dark hypostyle extending to the middle.

A round-topped tree 5–6 m. high, with wide-spreading branches, a trunk 17–25 cm. in diameter, dark scaly bark and slender glabrous slightly zigzag branchlets dark orange-brown or reddish and lustrous in their first season, becoming dull gray-brown and armed with many slender nearly straight spines 3–5 cm. in length.

MISSOURI. Marion County, uplands, Riverside Park, Hannibal, *John Davis*, No. 6, October 21, 1912, October 13, 1913, May 19, 1913 (type).

This plant has the thin acute sharply serrate leaves of many of the *Virides* species to which it bears a strong resemblance; the pink anthers, however, are unusual in that group except in the extreme south, and the 1–3 styles, the large solid fruit, the shape of the nutlets, the numerous, long spines and the rough bark all point to the *Crus-galli* Group to which it is now doubtfully referred.

*Crataegus araioclada* (§*Crus-galli*), n. sp.

Leaves oblong-obovate, acute or very rarely rounded at apex, gradually narrowed and cuneate at base, finely serrate above the middle with blunt or acute teeth, occasionally slightly and irregularly lobed, especially on leading shoots, thin, glabrous with the exception of a few hairs early



in the season on the upper side of the midrib, lustrous, 4–5 cm. long, 1.5–2 cm. wide and on leading shoots up to 6 cm. long and 4 cm. wide, with a slender midrib and thin primary veins; petioles slender, slightly wing-margined, glabrous or pubescent on the upper side early in the season, especially on leading shoots, 1–1.5 cm. in length. Flowers appearing the middle of April, 1.5 cm. in diameter, on slender glabrous pedicels, in small compact usually 5- or 6-flowered corymbs; calyx-tube broad-obconic, glabrous, the lobes gradually narrowed from the base, slender, acuminate, entire, glabrous on the outer surface, pubescent on the inner surface; stamens 20, anthers yellow; styles 3–5. Fruit (only one collected) ripening in October, in drooping few-fruited clusters, short-oblong, dull orange-red, 8–10 mm. in diameter, the calyx not enlarged, with a narrow shallow cavity pointed in the bottom.

A tree 4 or 5 m. high, with a trunk 35 cm. in diameter, covered with dark, slightly scaly bark divided into narrow ridges, a wide flat-topped head, and slender slightly zigzag glabrous branchlets bright chestnut brown or orange-brown during their first season and pale gray-brown the following year, and armed with many slender straight chestnut-brown spines 3–4 cm. in length.

LOUISIANA. Natchitoches Parish, border of upland woods Natchitoches, E. J. Palmer, Nos. 7234 (3) and 8848 (3), April 16 and October 6, 1915 (type).

This species seems distinct from the described species of the *Crus-galli* Group with glabrous corymbs, 20 stamens and yellow anthers, in its thin leaves lobed on vigorous shoots, in its compact few-flowered corymbs and slender branchlets. In the shape of the thin leaves and in the lobing of these on vigorous shoots, and in its slender branchlets it resembles species of the *Virides* Group, but the numerous spines and the hard dry fruit seem to place it in the *Crus-galli* Group.

*Crataegus subpilosa* (§*Crus-galli*), n. sp.

Leaves broad-obovate, rounded at apex, gradually narrowed and cuneate at base, finely often doubly serrate to below the middle with straight or slightly incurved callous tipped teeth, slightly pilose on the upper side of the midrib early in the season, otherwise glabrous, thick, dark green and lustrous above, paler below, 4–6 cm. long and 2–3 cm. wide; petioles slender, wing-margined to below the middle, sparingly pilose in May, becoming glabrous, 5–8 mm. in length. Flowers appearing early in May, about 1.2 cm. in diameter, on slender pedicels in compact mostly 12–15-flowered corymbs, like the pedicels slightly pilose; calyx-tube narrow-obconic, glabrous, the lobes slender, long-acuminate, entire, glabrous on the outer surface, sparingly pubescent on the inner surface; stamens 20, anthers pale yellow, styles 2 or 3. Fruit ripening the end of September, in small drooping glabrous clusters, short-oblong to subglobose, dull orange-red, 8–10 mm. in diameter, with thin dry flesh; calyx little enlarged, with a narrow cavity pointed in the bottom; nutlets 2 or 3 narrowed at the rounded ends, ridged on the back with a narrow ridge, 7–8 mm. long and 4–5 mm. wide.



A tree 4.5–5 m. high, with a trunk 20 cm. in diameter, covered with pale gray scaly bark, wide-spreading branches forming a round-topped head and stout branchlets slightly pilose when they first appear, becoming glabrous, orange-brown or dark reddish brown in their second year, and armed with many stout straight purple spines 3.5–5 cm. in length, becoming compound and much elongated on the trunk and large branches.

ARKANSAS. Carroll County, rocky hillsides near Eureka Springs, *E. J. Palmer*, No. 4451 (3), September 23, 1913, No. 5520 (3), May 9, 1914 (type).

This species is most closely related to *Crataegus fera* Beadle of western Louisiana, from which it differs in its much broader and thicker leaves, without the hairs of that species on their upper surface early in the season, in its slightly pilose not densely villose corymbs and in the glabrous calyx-tube.

***Crataegus transmississippiensis* (§Molles), n. sp.**

Leaves ovate to oval or elliptic, acute at apex, cuneate or occasionally rounded at base, finely double serrate usually to the base with acuminate callous tipped teeth, and slightly lobed above the middle with short triangular lobes; when they unfold coated above with short white hairs and densely tomentose below, and at maturity thin, glabrous above, slightly pubescent below on the slender midrib and primary veins, 5–6 cm. long and 3.5–4 cm. wide; petioles slender, densely tomentose when they first appear, becoming glabrous or puberulous 1.5–2.5 cm. in length. Flowers opening toward the end of April, in mostly 5–10-flowered small corymbs densely covered, like the pedicels and calyx-tubes, with long matted white hairs; calyx-lobes gradually narrowed from the base, slender, acuminate, laciniately glandular-serrate, villose, more densely on the outer than on the inner surface; stamens 10; anthers yellow; styles usually 3. Fruit ripening early in September, globose, scarlet, 1.5–1.7 cm. in diameter; nutlets usually 3, acute at base, broad and rounded at apex, 5 or 6 mm. long, 4–5 mm. wide.

A tree 6–7 m. tall, with a short trunk covered with furrowed bark, spreading branches forming a round-topped head, and stout branchlets thickly covered when they first appear with long matted white hairs, soon glabrous, dull reddish brown during their first season, becoming dark gray-brown and armed with occasional slender nearly straight spines 3–4 cm. in length.

ARKANSAS. Marion County, glades among rocks in open woods, *E. J. Palmer*, No. 8419 (6), September 1, 1915 (type), Baxter County, near Cotter, No. 17238 (6), April 18, 1920.

MISSOURI. McDonald County, Noel, *E. J. Palmer*, No. 4083, September 2, 1913; *B. F. Bush*, No. 7481, April 22, 1915; Stone County, near Galena, *E. J. Palmer*, No. 17236, April 18, 1920.

In the Molles Group the only species with leaves cuneate at base and flowers with 10 stamens and yellow anthers which has been described is *C. submollis* Sargent of eastern Canada and eastern Maine and Massa-



chusetts, which differs from this Missouri and Arkansas species in its larger more coarsely serrate leaves more deeply divided into acuminate lobes, in its broad many-flowered less densely villose corymbs and pyriform fruit.

***Crataegus brachyphylla* (§Molles), n. sp.**

Leaves broad-ovate, acute or rounded at apex, truncate or rounded at the wide base, coarsely often doubly serrate with straight acuminate teeth, covered above when they unfold with short hairs and below with long matted white hairs persistent during the season, and at maturity thin, yellow-green and glabrous on the upper surface, 5–7 cm. long and 5–6 cm. wide, with a slender midrib and primary veins; petioles slender, thickly covered with matted white hairs early in the season, becoming glabrous or nearly glabrous before autumn, 2–3 cm. in length; leaves on vigorous shoots rounded at apex, cordate at the broad base, slightly and irregularly laterally lobed, coarsely doubly serrate and up to 6–8 cm. long and wide, with petioles 2–3 cm. in length. Flowers 1.5 cm. in diameter, appearing from the first to the tenth of April when the leaves are more than half grown, in small compact 5–8-flowered corymbs densely covered, like the slender pedicels and narrow obconic calyx-tube, with long matted snow white hairs; calyx-lobes narrow, long-acuminate, laciniately glandular-serrate, thickly covered with white hairs; stamens 20, anthers deep rose color. Fruit ripening early in September, on slightly villose pedicels, in erect clusters, subglobose, dull dark red, 10–12 mm. in diameter, with thin flesh, the calyx little enlarged, with a deep narrow cavity pointed in the bottom; nutlets usually 3, acute at base, rounded at the broader apex, only slightly ridged on the back, 6–7 mm. long and 3–4 mm. wide, the broad hypostyle extending to the middle.

A tree 6–7 m. high, with a trunk 15–18 cm. in diameter, spreading branches forming an open irregular head, and slender nearly straight branchlets thickly covered with white hairs when they first appear, nearly glabrous, bright red-brown and lustrous at the end of their first season and pale gray the following year, and armed with occasional straight or slightly curved spines 3–4 cm. long and often unarmed.

ARKANSAS. Hempstead County, dry gravelly ridges in the shade of open woods largely composed of *Quercus Durandii* Buckley and *Q. arkansana* Sargent about five miles northwest of Fulton, *C. S. Sargent*, April, 22, 1901; *B. F. Bush*, No. 151, April 23, 1901, No. 19A, April 26, 1905, No. 5933, October 4, 1909; *E. J. Palmer*, No. 7205 (21), April 12, 1915 (type), No. 3975 (21b), October 19, 1915, No. 9392 (21) and No. 10607 (21), April 8 and September 5, 1916, Nos. 16333 and 16340, September 9, 1919.

This is one of the most distinct species of the Molles Group, differing from the other described species in its comparatively small leaves without lobes except on vigorous shoots, small flowers in small few-flowered corymbs, and small fruit. It is unusual, too, to find a tree of this group growing on dry gravelly hills. In the shape of its leaves and their pubescence it resembles *C. lanuginosa* Sargent from southwestern Missouri,



but the leaves of that species are thicker, distinctly blue-green and usually slightly lobed, its flowers are larger and the calyx cavity of the larger fruit is broader and deeper. *C. lanuginosa* grows on rocky hillsides in open situations, and the branches of few species are furnished with such long and numerous spines.

***Crataegus notha*** (*C. apiifolia*  $\times$  *brachyphylla*), n. hyb.

Leaves broad-ovate, acute at apex, abruptly cuneate, rounded or truncate at base, coarsely and sharply doubly serrate usually only above the middle, and slightly and irregularly lobed, when they unfold thickly covered with matted white hairs, and at maturity thin, glabrous above, pubescent below, 3–4 cm. long and 2.5–3 cm. wide, with a thin midrib and slender primary veins occasionally running to the sinuses as well as to the points of the lobes; petioles slender, densely villose early in the season, becoming nearly glabrous, 1.5–3 cm. in length; leaves on vigorous shoots truncate or subcordate at base, more coarsely serrate, usually 3-lobed by deep narrow lateral lobes pointed in the bottom, and up to 5 cm. long and 5–6 cm. wide, with petioles usually about 2.5 cm. in length. Flowers appearing late in March, 1.5–1.7 cm. in diameter, on slender pedicels densely hoary-villose like the compact usually twelve to fifteen-flowered corymbs; calyx-tube narrow-obconic, densely villose, the lobes gradually narrowed from the base, acuminate, glandular, laciniately serrate, slightly villose; stamens 20, anthers deep rose color, styles 2–4. Fruit ripening the end of September, not abundant, on glabrous pedicels, ovoid, bright scarlet, 10 mm. long and 6–8 mm. wide, with soft succulent flesh, the calyx little enlarged with a deep narrow cavity pointed in the bottom; nutlets usually 4, acute at the ends, rounded and occasionally slightly ridged on the back, about 6 mm. long, 4 mm. wide.

A tree 6 or 7 m. high, with a trunk 15–20 cm. in diameter, covered with thin pale bark separating in small thin flake-like scales, stout spreading smooth pale gray branches forming an open irregular head, and slender slightly zigzag branchlets covered when they first appear with matted white hairs, becoming glabrous or nearly glabrous and reddish brown by the end of their first season and dull gray-brown the following year, and unarmed or armed with an occasional slender straight chestnut brown spine up to at least 4.5 cm. in length.

ARKANSAS. Hempstead County, dry gravelly hills about five miles northwest of Fulton, in open Oak-woods, *C. S. Sargent*, April 23, 1901; *B. F. Bush*, No. 154, April 23, 1901, No. 12, April 17, 1905, Nos. 12, 12A, 12B, March 26, 1909 (in flower); *E. J. Palmer*, No. 8974 (21 A), October 19, 1915, No. 9391 (21 A), No. 16333, September 9 1919, No. 20646, September 26, 1921 (type).

Mr. Palmer, who has watched this tree for several years, suggests that it is a hybrid between *C. apiifolia* Michaux and *C. brachyphylla* Sargent, both of which are growing with it. The bark of the trunk is that of *C. apiifolia* and the fact that a primary vein sometimes extends to the base of a sinus of a leaf, the character by which the Microcarpae Group



is best distinguished, also indicates its relationship with *C. apiifolia*. From that species it differs in its larger more pubescent only occasionally lobed leaves often cuneate at base in its more pubescent corymbs of larger flowers with a more pubescent calyx, and in its larger fruit. The pubescence of *C. notha*, although less dense is in character and persistency that of *C. brachyphylla*; the larger rarely lobed leaves, the larger flowers and fruit and the nearly unarmed branches may also be due to the influence of that species. Five individuals are now known, one a solitary tree and the other in a group. They all grow in the immediate vicinity of their supposed parents. If *C. notha* is a hybrid, and there seems to be good reason for the belief, it is a plant of unusual interest, showing as it would the possibility of crossing species of two as distinct groups of the genus as are now recognized. It would be, too, the only hybrid *Crataegus* which has been found in North America.

***Crataegus brachycantha* f. *leucocarpa*, n. forma.**

Differing from the type only in the white or pale straw-colored fruit marked by dark dots.

LOUISIANA. Natchitoches Parish, Natchitoches, *E. J. Palmer*, No. 8719 (12) September 28, 1915 (type).

***Crataegus nuda* (§*Macracanthae*), n. sp.**

Leaves ovate to obovate, acute and often abruptly short-pointed at apex, gradually narrowed and cuneate at base, sharply and often doubly serrate often to below the middle, thin, glabrous, yellow-green above, paler below, 5–8 cm. long, 3–4 cm. wide, with a thin midrib and 6 or 7 pairs of slender primary veins; petioles slender, glabrous, slightly wing-margined, 1–1.5 cm. in length; leaves on vigorous shoots thicker, more coarsely serrate, to 7 or 8 cm. long and 4 cm. wide, with stouter petioles often winged to the base. Flowers appearing in the Arboretum in June (June 7, 1913, June 20, 1917), 1.5 cm. in diameter, on slender glabrous pedicels in wide compact many-flowered corymbs; calyx-tube narrow-obconic, glabrous, the lobes slender, long-acuminate, entire; stamens 10, anthers pale pink, soon white; styles 2. Fruit ripening the end of September, short-oblong to subglobose, bright red, about 1 cm. in diameter, with thin flesh; calyx little enlarged, with a comparatively wide deep cavity pointed in the bottom; nutlets 2, suborbicular, prominently ridged on the back, irregularly penetrated on the inner face by wide irregular depressions, 4 or 5 mm. long and broad, the narrow hypostyle extending to below the middle.

A tree 7 or 8 m. high, with slender nearly straight glabrous red-brown lustrous branchlets, becoming dark gray-brown and armed with numerous nearly straight slender spines 3–4.5 cm. in length.

MISSOURI. Taney County, woods near Swan, *C. S. Sargent*, October 1899 (type); *B. F. Bush*, No. 12A, September 25, 1905, Nos. 12 and 13, April 21 and May 16, 1907; Arnold Arboretum No. 4439 (Seed List 18), June 7 and October 9, 1913, June 20 and September 24, 1917, September 29, 1900, August 1, 1921.



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