CRATAEGUS IN OHIO WITH DESCRIPTION OF ONE NEW SPECIES

ERNEST J. PALMER
Webb City, Missouri

This review of Crataegus in Ohio has been made in cooperation with the Ohio Flora Committee of the Ohio Academy of Science as a contribution to their forthcoming flora of the state. Many of the universities and colleges of the state have sent collections of herbarium specimens to me for examination, and information has been drawn from these and other sources including some private collections. The large collection in the herbarium of the Ohio State University, covering most of the state, has been particularly helpful. Other institutions sending large collections were the University of Cincinnati, Oberlin College, Miami University, and Defiance College. Dr. E. Lucy Braun also sent many interesting collections from her private herbarium; and she has given invaluable assistance in outlining the work and in cooperating with it in many ways. In addition to the larger collections mentioned above, specimens have been received from Ohio University, Dennison University, Kent State University, Antioch College, and from the private collection of Mr. John Guccion of Cleveland. Dr. Gerald B. Ownbey also sent a number of collections from Ohio deposited in the herbarium of the University of Minnesota. The large amount of material from Ohio in the herbarium of the Arnold Arboretum, Jamaica Plain, Massachusetts, was also checked, including duplicates of many of the collections seen in Ohio herbaria, and also fuller collections made by R. E. Horsey in many parts of the state, and by F. J. Tyler, Harry Crowfoot, and C. C. Clevenger, mostly in Lake and adjoining counties. Many other scattered specimens have also been received and checked.

But after examining all of these records it is obvious that much remains to be done before a complete list of the Crataegus flora of the state can be made, or anything like full data on the distribution of the species in the state can be given. It is possible that some species of Crataegus are indigenous in every county; several of the commoner species, such as Crataegus crus-galli and C. pinnata have a statewide distribution and might be expected in nearly if not all of the counties. C. mollis, generally on calcareous soil, is almost limited to western Ohio where calcareous soils prevail; there, it is in almost every county. At present there are a number of counties from which we have no records. This is no doubt due to the fact that botanical interest and collecting is always sporadic and unevenly distributed. Full and systematic collecting is usually limited to the vicinities of the larger educational institutions or of the homes of amateur botanists. What is done in other sections is occasional and scattered.

Crataegus is the largest genus of woody plants found in Ohio; and this also holds true for the entire United States. Nearly all of the species are small trees or arborescent shrubs found growing in thickets or on the borders of woods, and they have often become established in pastures and along fencerows. Their dispersion is probably largely due to birds that feed upon the fruit and deposit the undigested seeds in their droppings. Since most of the species cannot stand the competition of larger trees, the genus is rare or absent in densely forested areas; there are fewer records from wooded eastern Ohio than from agricultural western Ohio. It is certain that there has been a very great increase in individuals and in the areas available to them since much of the country has been cleared and brought into cultivation. The changed conditions and increased

competition between the original species have probably resulted in the development of many new forms and hybrids.

While most species of *Crataegus* are not absolutely selective as to soil, they show a decided preference for alkaline soils, and they are most abundant and varied in limestone regions; this is well illustrated by the range of *C. mollis*. The *Crataegus* flora of Ohio is a large and diverse one due to the wide range of ecological conditions found in the state and to the fact that large areas are underlaid with limestone or are covered with alkaline or neutral soils. The list contains 67 species, including 4 that are represented only by a variety other than the typical one, 30 additional varieties, 2 forms, and 4 unnamed hybrids. It is not unlikely that a few more might be added by further exploration. Three species, *Crataegus oxyacantha*, *C. monogyna*, and *C. prunifolia*, have been introduced, and are now

\[\text{Figure 1}\]

*Crataegus Horseyi* n. sp. a. Flowers and leaves of flowering branchlet. b. Leaf of vigorous terminal shoot, maximum size. c. Fruits. All figures natural size.
common in cultivation in both European and American gardens. The first two, commonly known as English Hawthorn, are natives of the Old World, and occur more or less frequently as escapes from cultivation. *C. prunifolia*, rarely occurring as an escape, was described from a tree found growing in a European garden, and appears to be a hybrid between two North American species, *C. crus-galli* and *C. Calpodendron* or a related species.

The hawthorns or red haws are amongst our most ornamental trees. Their profusion of fragrant blossoms, often opening before or with the leaves, their widely variable but often thick and glossy foliage, and the abundant usually bright-colored fruit, combine to make them attractive throughout the year. Another advantage that recommends them for planting is the abundant supply of bird food they supply. For the haws are eaten by birds not only at the time of ripening, but also later; the fruit of some species stays on the trees until late in the season, and often it remains on the ground through the winter, thus affording food for birds and small mammals when most other sources have been exhausted. For these reasons, a number of native species are now often planted in parks and private grounds, and particularly along parked roadways. American hawthorns were also early introduced into English and other European gardens, and they have long been more appreciated abroad than in their native country. The English hawthorn is also popular in cultivation here; in some forms the flowers are double, or are pink or red in color. It is famous in literature and folklore, and is closely associated with the Mayday festival and other holidays. It is commonly used for hedges in parts of rural England; some American species could be used to advantage where a dense ornamental hedge is desired.

The classification of *Crataegus* is one of the most puzzling and difficult in American botany. Botanists have disagreed widely as to how many species should be recognized and as to the value of the characters that have been used to distinguish them. Some species are well-marked and as easily recognized as species in other large genera. But in certain sections there is so much variability and merging of characters that it is most difficult to distinguish them, and it becomes a matter of opinion where the lines should be drawn between species. More than 1500 names have been proposed for American Crataegi, and most of these have been called species. But most students have come to believe that many of them can more properly be regarded as forms of variable species, that many are of hybrid origin, and others are transient sports or clones that could only be propagated vegetatively, and that can scarcely be called species as the term is generally understood. A considerable proportion of the proposed species are extremely local, and in some cases were known only from a single plant. The whole subject is a very complicated one and one in which there is much room for differences of opinion. Much more study and experimental work is needed to determine the validity and relationship of many species and forms. Any classification that has so far appeared can only be regarded as a tentative and provisional one.

The characters that have usually been used to distinguish species and other segregates in *Crataegus* are the shape, size, texture, and other variations in the leaves; the size and number of the flowers and their arrangement and structural parts, such as petals, sepals, stamens, anthers, and styles; the size, shape, color, and texture of the fruit; number and form of the nutlets; and size and form of the calyx. Of lesser importance but often described are the habit of growth, and characters of branches, bark, and thorns. All of these characters are variable and are combined with each other in various ways. In some cases, characters differ within the species, while in others some of them are sufficiently constant to differentiate the species. Much stress has been laid, especially by Sargent, on the number of stamens and the color of the anthers. But while they seem fairly
constant in some species they are not so in others; except where they are supple-
mented by other distinctions they cannot be relied on as specific distinctions.
So until fuller information is available as to the origin and genetic relationships of
the many intermediate forms, a conservative treatment seems most practicable
and advisable.

CRATAEGUS L.

The name is from a Greek word signifying strength or invincibility; and it
probably referred to the dense and thorny nature of the plants that made them
immune from attack rather than to the strength of the wood, as has often been
suggested. The plants are shrubs or small trees usually with crooked thorny
branches. The leaves are alternate and vary greatly in shape and size in different
species, and to some extent within the species. Terminal leaves of sterile shoots
or of new and vigorous growth are often unlike those of the flowering branchlets.
Such leaf specimens should never be collected for determination except in con-
nection with flowering or fruiting material. The flowers are regular, normally
with five petals and five to twenty stamens, and one to five styles. In most species
they are several in number, borne in simple or branching corymbs or cymes, or
rarely they grow singly or two or three in a close cluster. The fruit is a pome or
haw with one to five bony nutlets embedded in the firm to succulent flesh. The
fruits vary in shape from subglobose to oblong-cylindric, ovoid, or obovoid; they
are sometimes slightly 5-angled. In our species, the color when ripe is some shade
of red or more rarely yellow; but some species remain green and hard throughout
the season. The fruit of some species is edible with a pleasing and distinctive
flavor. While little use is made of it in this region, it has economic possibilities
through selection and cultivation. One disadvantage is that it commonly
infested with the larva of a weevil; but this might be corrected by spraying.

For convenience, the genus has been divided into a number of groups or series that
differ from each other in the degree of their distinctness of characters. Fourteen series
are recognized as occurring in Ohio. A key to these, together with a list of the
species, varieties, and forms under the different series is given below with essential
synonymy and a list of the counties in which each has so far been found. Keys,
descriptions of the series, and notes concerning the species will be published in
the proposed Flora of Ohio. Several new combinations and the description of
one new species are published here. Incomplete or inconclusive material
examined indicates a few other unrecognized forms, species or hybrids.

KEY TO THE SERIES

a. Veins of the leaves running to the sinuses as well as to the points of the lobes; leaves mostly
ovate or deltoid in outline, distinctly lobed; fruit subglobose, 4–10 mm. thick.
b. Leaves often trilobate, up to 5–6 cm. long, thin, turning red or yellow in autumn, early
deciduous; flowers in many-flowered compound corymbs, opening in late May or
early June; fruit 4–6 mm. thick, bright red, becoming succulent, remaining on branches
until late winter; nutlets 3–5.............................1. CORDATAE
bb. Leaves usually deltoid or broadly ovate in outline with 5–7 lobes, firm in texture,
remaining green and persistent until late in season; flowers opening usually before
middle of May; fruit firm or mellow at maturity, falling early; nutlets 1–2 or rarely
3..........................................................2. OXYACANTHAE
aa. Veins of the leaves running only to the points of lobes or larger teeth; leaves entire or
variously lobed; fruit subglobose, oval, ovoid, or pyriform, 0.5–1.5 cm. thick.
b. Flowers single or rarely 2–3 in cluster; stamens 20–25; sepals foliaceous, pectinate;
slender shrubs usually less than 1.5 m. tall.........................3. PARVIFOLIAE
bb. Flowers more numerous, in simple or compound corymbs or cymes; stamens 5–20;
sepals entire or glandular-serrate, not foliaceous; trees or stout arborescent shrubs.
c. Leaves of various shapes, cuneate to subcordate at base, glabrous or pubescent;
fruit 0.5–1.5 cm. thick; nutlets 1–5, not pitted on ventral surface.
d. Leaves mostly spatulate or obovate, broadest above middle except rarely on
terminal shoots; unlobed or sometimes more or less lobed on terminal shoots.
No. 4 CRATAEGUS IN OHIO

- Leaves firm to subcoriaceous, often glossy above, the veins inconspicuous or rarely slightly impressed above; flowers 1-1.5 cm. wide; fruit usually 1-1.3 cm. thick or less, with 1-2 or rarely 3-5 nutlets, remaining hard and inedible, usually dull red or green at maturity. CRUS-GALLI

- Leaves firm but not subcoriaceous, dull above, the veins noticeably or conspicuously impressed above; flowers usually 1.3-2 cm. wide; fruit usually becoming mellow and somewhat edible; nutlets 3-5. INTRICATAE

- Leaves mostly rhombic, ovate, oblong-ovate, or deltoid in outline, broadest below or about middle, usually more or less lobed at ends of shoots. CRUS-GALLI

- Foliage and inflorescence glandular, often conspicuously so; leaves usually narrowed at base, except sometimes at ends of shoots; flowers mostly 3-8 in simple or little-branched corymbs; fruit usually becoming mellow and somewhat edible; nutlets 3-5. INTRICATAE

- Foliage and inflorescence eglandular or sometimes sparsely glandular when young; flowers usually 8-15 or more in simple or compound corymbs. INTRICATAE

- Leaves mostly ovate, oblong-ovate, or elliptic in outline, abruptly narrowed or rounded at base, or sometimes deltoid or suborbicular at ends of shoots; fruit usually bright or dull red at maturity, firm to succulent; nutlets usually 3-5. INTRICATAE

- Foliage and inflorescence glandular, often conspicuously so; leaves usually narrowed at base, except sometimes at ends of shoots; flowers mostly 3-8 in simple or little-branched corymbs; fruit usually becoming mellow and somewhat edible; nutlets 3-5. INTRICATAE

- Leaves mostly ovate, oblong-ovate, or deltoid in outline, abruptly narrowed or rounded at base, or at ends of shoots broadly ovate to deltoid and often truncate to subcordate at base, more or less lobed; fruit 0.8-1.7 cm. thick; nutlets 3-5. INTRICATAE

- Leaves mostly ovate, more or less incised with acute lobes terminating in acuminate, often reflexed points, thin at maturity, glabrous except for short appressed hairs on upper surface while young; flowers 1.3-1.8 cm. wide; pedicels glabrous (except in C. lucorum); anthers pink; fruit 0.8-1.5 cm. thick, usually becoming mellow or succulent; nutlets 3-5. INTRICATAE

- Leaves mostly ovate or oblong-ovate, firm to thick at maturity, more or less incised, the points of lobes not reflexed; flowers 1.3-2.5 cm. wide; stamens 8-20; fruit 0.8-1.7 cm. thick; nutlets 3-5. INTRICATAE

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SERIES I. CORDATAE

1. Crataegus Phaenopyrum (L.f.) Medic. (C. cordata Ait.)
   Belmont, Butler, Clinton, Guernsey, Hamilton, Jefferson, Montgomery, Preble.

SERIES II. OXYACANTHAE

2. Crataegus Oxyacantha L.

3. Crataegus monogyna Jacq.

SERIES III. PARVIFOLIAE

4. Crataegus uniflora Muenchh. (C. trianthoflora Sarg.)
   Adams, Meigs.

SERIES IV. CRUS-GALLI

5. Crataegus crus-galli L.
   a. var. crus-galli (C. aigens Beadle, C. arduennae Sarg., C. attenuata Ashe, C. eburnea Ashe, C. mollipes Ashe, C. trahax Ashe)
   b. var. barrettiana (Sarg.) Palmer (C. barrettiana Sarg.)
      Clinton, Erie, Franklin, Hamilton, Lawrence, Ottawa.
   c. var. exigua (Sarg.) Eggles.
      Ashland, Clark, Geauga, Hamilton, Harrison, Lucas, Tuscarawas.
   d. var. leiophylla (Sarg.) Palmer (C. leiophylla Sarg.)
      Franklin, Lake, Richland.
   e. var. pachyphylla (Sarg.) Palmer (C. pachyphylla Sarg.)
      Hamilton, Ottawa.
   f. var. pyracanthifolia Ait.
      Hamilton, Muskingum.

   Richland.

7. Crataegus Fontanesiana (Spach) Steud. (C. geneseeensis Sarg., C. tenax Ashe, C. Wilkinsoni Ashe)
   Auglaize, Butler, Crawford, Cuyahoga, Defiance, Lake, Ottawa, Perry, Richland, Scioto, Shelby, Tuscarawas, Wayne.

8. Crataegus hannibalensis Palmer
   Defiance.

   Hamilton, Franklin.

10. Crataegus ohioensis Sarg.
    Franklin.

11. Crataegus pyracanthoides Beadle, var. arborea (Beadle) Palmer (C. arborea Beadle)
    Carroll, Lucas, Morgan, Ottawa.

    Clark.
13. Crataegus punctata Jacq.
   a. var. punctata
   b. var. aurea Ait. (C. crocata Ashe)
      Clinton, Delaware, Fulton, Hamilton, Hardin, Lake, Mahoning, Ottawa, Paulding, Preble, Richland.
   c. var. canescens Britt.
      Crawford, Hancock, Hardin, Lorain, Medina.
   d. var. microphylla Sarg.
      Geauga, Lake, Wood.
   e. var. pausiaca (Ashe) Palmer (C. pausiaca Ashe, C. calvescens Sarg., C. porrecta Ashe)
      Fayette, Harrison, Jefferson, Lake, Licking, Miami.


15. Crataegus Kellermanii Sarg.
    Fairfield, Franklin, Lake, Tuscarawas.

    Franklin, Richland.

17. Crataegus indicens Ashe
    Richland.

    Franklin, Hamilton, Lawrence, Monroe, Ross.

    Ottawa.

20. Crataegus intricata Lange
   a. var. intricata (C. diversifolia Sarg., C. inducta Ashe, C. meticulosa Sarg.)
   b. var. straminea (Beadle) Palmer (C. straminea Beadle)
      Gallia.

21. Crataegus Boyntoni Beadle
    Adams, Guernsey, Lawrence, Morgan, Noble.

22. Crataegus rubella Beadle
    Athens, Hardin, Jackson, Summit.

23. Crataegus fortunata Sarg.
    Adams, Pickaway.

24. Crataegus Horseyi Palmer, sp. nov.
    Type locality, Gallia County.

**Crataegus Horseyi** sp. nov. Frutex circa 2–4 m. altus ramis sinuosis ascendentibus; ramulis gracilis fusco-rubris spiniferis. Spinae gracilae rectae aut leviter curvae fusco-purpureae 2–5 cm. longae, in ramulis infirmis ramosis. Cortex confertus fusco-canus. Folia glabra aliquantum tenues plerumque elliptica
aut oblongo-ovata apice acuta basi obtuso-cuneata ad attenuata, margine acuto-serratis superne obscuro-lobatis circiter 2-4 cm. longis 2-3.3 cm. latis. Folia circulorum oblongo-ovata basi rotunda perspicue lobata firma 5-6 cm. longa 4-6 cm. lata. Petioli gracili glandulosi superne alati 1-2 cm. longi. Flores 1-1.3 cm. lati plerumque 3-5 in corymbis glabrescentis simplicibus; pedicellis .9-1.2 cm. longis; staminibus 5-10 saepe 5; antheris rubicundus; stylis plerumque 3; sepalis lanceolatis margine integris aut incomposites glandulo-serratis; bracteis linearis stipitoglandulosis. Fructus subglobosi 6-9 mm. lati fusco-viridi vel tandem rubicunduli firmi calyce prominente efferto tubo brevi; semenibus plerumque 3.

A shrub 2-4 m. tall usually with several crooked ascending stems and slender thorny branchlets. Thorns sometimes compound on the older stems, slender, straight or slightly curved on branchlets, 2-5 cm. long. Bark close, dark gray. Leaves glabrous, those of the flowering branchlets mostly elliptic or oblong-ovate, pointed or short acuminate at apex, cuneate or attenuate at base, sharply serrate with fine gland-tipped teeth reduced to glands near base of blades, slightly or obscurely lobed above the middle. Petioles slender, \( \frac{1}{4} \) to \( \frac{1}{6} \) as long as the blades, glandular, slightly wing-margined above. Flowers 1-1.3 cm. broad in simple mostly 3-5 flowered glabrous corymb; pedicels .8-1.5 cm. long; stamens 5-10, often 5; anthers pink; styles usually 3; sepals lanceolate from a broad base, the margins nearly entire or irregularly glandular-serrate. Bracts conspicuous at flowering time, linear, thickly set with stalked glands on the margins. Fruit subglobose, 6-9 mm. thick, dull green or becoming slightly red late in the season, with a prominent slightly elevated calyx, thin dry flesh and usually 3 nutlets.


**Crataegus Horseyi**, of the Intricatae series, is perhaps most nearly related to **Crataegus rubella** Beadle. But it differs from that species in its slightly smaller leaves with more slender petioles, its more compact inflorescence of smaller flowers with usually 5 stamens, and in the globose fruit which is dull green or only slightly reddened, instead of being bright red or orange, and with regularly 3 nutlets. It should be looked for at intermediate or other stations in the region where it has been found. Thanks are due to my daughter, Grace Palmer, for the figure that accompanies the description.

25. **Crataegus biltmoreana** Beadle (C. polybracteata Ashe, C. modesta Sarg., C. intricata of Eggles., not Lange)

Fairfield, Greene, Tuscarawas.

**SERIES VII. ROTUNDIFOLIAE**

26. **Crataegus Margaretta** Ashe
   a. var. Margaretta
      forma xanthocarpa Sarg.
      Defiance.
   b. var. Brownei (Britt.) Sarg. (C. Brownei Britt.)
      Franklin, Union, Washington, Williams.
   c. var. meiophylla (Sarg.) Palmer (C. meiophylla Sarg.)
      Adams, Butler, Defiance, Hardin.
27. Crataegus sicca Sarg. var. *glabrifolia* (Sarg.) Palmer, stat. nov. (*C. glabrifolia* Sarg.)
Cuyahoga, Defiance, Lawrence.

**SERIES VIII. BRAINERDIANAE**

   a. var. Brainerdi
      Lucas, Richland.
   b. var. scabrida (Sarg.) Egglest. (*C. scabrida* Sarg.)
      Richland.

29. Crataegus Coleae Sarg. (*C. incerta* Sarg.)
   Auglaize, Mahoning.

**SERIES IX. TENUIFOLIAE**

30. Crataegus macrosperma Ashe
   b. var. acutiloba (Sarg.) Egglest. (*C. acutiloba* Sarg.)
      Franklin, Jefferson, Williams.
   c. var. demissa (Sarg.) Egglest. (*C. demissa* Sarg., *C. sextilis* Sarg.)
      Logan, Lorain, Trumbull.
   d. var. matura (Sarg.) Egglest. (*C. matura* Sarg., *C. acuminata* Sarg.)
      Franklin, Ottawa.
   e. var. pentandra (Sarg.) Egglest. (*C. pentandra* Sarg., *C. exigua* Ashe)
      Lorain, Richland, Trumbull, Vinton.
   f. var. roanensis (Ashe) Palmer (*C. roanensis* Ashe)

31. Crataegus basilica Beadle (*C. taetica* Sarg.)
    Richland.

32. Crataegus lucorum Sarg. (*C. decens* Ashe)
    Franklin, Richland, Vinton.

**SERIES X. SILVICOLAE**

33. Crataegus iracunda Beadle, var. silvicola (Beadle) Palmer (*C. silvicola* Beadle, *C. drymophila* Sarg.)
    Washington.

34. Crataegus beata Sarg. (*C. opulens* Sarg.)
    Holmes, Jackson, Lucas, Morrow, Union.

35. Crataegus brumalis Sarg.
    Ashtabula, Geauga, Lake, Tuscarawas.

36. Crataegus gravis Ashe (*C. remotula* Sarg.)
    Ashtabula, Franklin, Hardin, Jefferson, Lake, Mahoning, Ottawa, Trumbull.

37. Crataegus populnea Ashe (*C. blairensis* Sarg., *C. marcida* Ashe, *C. propinqua* Ashe)
    Ashtabula, Erie, Franklin, Lake, Lorain, Richland, Trumbull, Tuscarawas.

38. Crataegus stolonifera Sarg.
    Lorain, Portage.
39. Crataegus pruinosa (Wendl.) K. Koch
a. var. pruinosa (C. amoena Sarg., C. ater Ashe, C. horridula Sarg., C. Howeana Sarg., C. sitiens Ashe)
   forma angulata (Sarg.) Palmer (C. angulata Sarg., C. placiva Sarg.)
   Jackson, Washington.

b. var. dissona (Sarg.) Egglest. (C. dissona Sarg., C. marriettensis Sarg., C. relicta Sarg.)
   Butler, Defiance, Hardin, Lake, Lawrence, Lorain, Richland, Scioto, Tuscarawas, Washington.

c. var. brachypoda (Sarg.) Palmer (C. brachypoda Sarg.) Clermont, Meigs.

d. var. latisepala (Ashe) Egglest. (C. latisepala Ashe, C. cognata Sarg., C. conjuncta Sarg., C. jejuna Sarg.)
   Franklin, Gallia, Jefferson, Lake, Mahoning, Meigs, Ottawa, Perry, Richland, Vinton, Washington.

40. Crataegus compacta Sarg. (C. ellipticifolia Sarg., C. repentina Sarg.)
   Brown, Delaware, Franklin, Jackson, Lake, Ross.

41. Crataegus Crawfordiana Sarg.
   Union.

42. Crataegus disjuncta Sarg.
   Mahoning.

43. Crataegus formosa Sarg.
   Wood.

44. Crataegus franklinensis Sarg.
   Erie, Franklin, Lawrence.

45. Crataegus gaudens Sarg.
   Lake, Perry.

46. Crataegus Gattingeri Ashe (C. bedfordensis Sarg.)

47. Crataegus Jessupi Sarg. (C. divisifolia Sarg.)
   Ashland, Franklin, Ottawa.

   Harrison, Jefferson, Lorain, Muskingum.

49. Crataegus locuples Sarg.
   Clermont, Coshocton, Franklin, Gallia, Highland, Lake.

50. Crataegus Mackenzii Sarg., var. bracteata (Sarg.) Palmer (C. bracteata Sarg.)
   Delaware, Franklin, Meigs.

51. Crataegus Milleri Sarg.
   Ashtabula, Lake.

52. Crataegus Porteri Britt.
   Ashtabula, Lake, Muskingum, Portage.

53. Crataegus rugosa Ashe (C. onusta Ashe)

54. Crataegus virella Ashe
   Richland.
55. Crataegus pedicellata Sarg.
   a. var. pedicellata (C. sejuncta Sarg.)
   b. var. assurgens (Sarg.) Palmer, stat. nov. (C. assurgens Sarg.)
      Ashtabula, Coshocton, Cuyahoga, Geauga, Lake, Lucas, Ottawa, Trumbull, Wood.
   c. var. Robesoniana (Sarg.) Palmer (C. Robesoniana Sarg.)
      Lake, Richland.
   d. var. albicans (Ashe) Palmer (C. albicans Ashe, C. cristata Ashe)

56. Crataegus Holmesiana Ashe
   a. var. Holmesiana
      Cuyahoga, Lorain, Monroe.
   b. var. amicta (Sarg.) Palmer (C. amicta Sarg., C. elongata Sarg.)
      Richland.

57. Crataegus Habereri Sarg.
   Jefferson, Lake, Lorain.

58. Crataegus Hillii Sarg.
   Lake, Paulding, Richland.

59. Crataegus pennsylvanica Ashe
   Clinton, Cuyahoga, Franklin.

60. Crataegus Pringlei Sarg.
   Jackson, Lake, Ottawa, Richland, Shelby, Williams.

61. Crataegus Putnamiana Sarg.
   Brown, Franklin, Gallia, Lawrence, Licking, Meigs, Washington, Wood.

SERIES XIII. MOLLES

62. Crataegus mollis (T. & G.) Scheele
   a. var. mollis (C. redolens Ashe)
   b. var. sera (Sarg.) Egglest. (C. sera Sarg., C. mollipes Sarg.)
      Lake.

63. Crataegus submollis Sarg.
   Lake.

SERIES XIV. MACRACANTHAE

64. Crataegus succulenta Link.
   a. var. succulenta (C. gemmosa Sarg., C. rutila Sarg.)
   b. var. macracantha (Lodd.) Egglest. (C. macracantha Lodd.)
      Franklin, Ottawa, Vinton.
   c. var. michiganensis (Ashe) Palmer (C. michiganensis Ashe)
      Wayne.
   d. var. neofluvialis (Ashe) Palmer (C. neofluvialis Ashe, C. tanuphylla Sarg.)
      Richland.
e. var. pertomentosa (Ashe) Palmer (C. pertomentosa Ashe) 
    Auglaize, Butler, Richland.
65. Crataegus Calpodendron (Ehrh.) Medic.
   a. var. Calpodendron (C. pubifolia Ashe, C. structilis Ashe, C. tomentosa of many auth.) 
      Athens, Auglaize, Butler, Clermont, Clinton, Defiance, Erie, Fairfield, Franklin, 
      Hamilton, Hardin, Lake, Lawrence, Licking, Logan, Lorain, Lucas, Meigs, Montgomery, 
      Ottawa, Perry, Portage, Putnam, Sandusky, Scioto, Stark, Trumbull, 
      Washington, Wayne, Wood.
   b. var. globosa (Sarg.) Palmer (C. globosa Sarg.) 
      Preble, Wood.
   c. var. microcarpa (Chapm.) Palmer (C. tomentosa var. microcarpa Chapm., C. tomentosa 
      var. Chapmani Beadle, C. Chapmani Ashe) 
      Gallia.
66. Crataegus laetifica Sarg.
   . Defiance, Geauga, Lake, Richland.
67. Crataegus prunifolia (Poir.) Pers.
   . Lake. (an escape)

HYBRIDS

Crataegus Calpodendron x crus-galli 
    Lake, Trumbull.
Crataegus crus-galli x succulenta var. macracantha? 
    Defiance.
Crataegus Margaretta x mollis 
    Preble.
Crataegus mollis x pedicellata?
    Clermont.

It is suspected that several others that have been described as species are of 
hybrid origin. But in the absence of positive evidence, they are treated under 
the published names.