

(in Herb. Arnold Arboretum) collected by C. L. Anderson near Santa Cruz, California, with narrow pubescent leaves, a glabrous rachis and puberulous branchlets, and referred by Koehne to his *P. demissa* var. *Nuttallii* f. *holotricha*.

*Prunus virginiana* var. *melanocarpa*, nov. comb. — *Cerasus demissa* var. *melanocarpa* A. Nelson in Bot. Gaz. xxxiv. 25 (1902). *Prunus melanocarpa* Rydberg in Bull. Torr. Bot. Club, xxxiii. 143 (1906).

This is the widely distributed Rocky Mountain form of the Choke Cherry, differing from the eastern typical form in its rather thicker leaves and usually darker fruit sometimes black or nearly black at maturity. This is a common usually shrubby plant often only 2° or 3° high, or occasionally a tree, distributed from western North and South Dakota and Nebraska to southern Colorado, New Mexico and southern Arizona to the Pacific coast where it ranges from British Columbia to San Diego County, California. In North Dakota the eastern and western forms "intergrade so completely that there is no way of distinguishing them except in extreme cases. The difference is apparently due to the conditions under which they grow, so that they are to be considered merely as forms of the same species."<sup>1</sup>

A form with yellow fruit may be distinguished as forma *xanthocarpa*, n. forma. Near La Veta, Huerfano County, Colorado, C. S. Sargent, August, 1911.

*Prunus virens* Shreve.

This New Mexican and Arizona Cherry-tree, although very closely related to *Prunus serotina* Ehrhart, may be distinguished from that species by its smaller more finely serrate glabrous usually elliptic or oval to rarely oblong-obovate or ovate leaves acute or rounded, rarely acuminate, at apex and cuneate at base, by its eglandular petioles, by its shorter racemes and smaller flowers. In the typical form the leaves are glabrous, but on some trees the under side of the midrib of the leaves is furnished on the margins below the middle with a thick coat of rusty pubescence showing the connection of these trees with

*Prunus virens* var. *rufula*, n. var. — *Padus rufula* Wooton & Standley in Contrib. U.S. Nat. Herb. xvi. 132 (1913).

Differing from the type in the rusty brown persistent pubescence on the under side of the midrib of the leaves, the pubescent petioles, the pubescence on the lower part of the rachis, the puberulous ovary, and in the rusty brown pubescence of the young branchlets.

The type of *Padus rufula* (No. 563998 in U.S. Nat. Herb.) collected on the west fork of the Gila River, Arizona, August, 1900, has leaves only 4-4.5 cm. in length and branchlets thickly covered with matted rusty hairs. The specimens in the National Herbarium referred to *Padus rufula* vary in the amount of the pubescence on the branchlets, and those of No. 497841

<sup>1</sup> H. F. Bergman, Fl. North Dakota in Sixth Biennial Rep. North Dakota Soil and Geological Survey, 207 (1912).



collected in flower in 1904 on the Black Range, New Mexico, by O. B. Metcalfe are nearly glabrous.

**DISTRIBUTION.** With the species on many of the mountain ranges of southern New Mexico and Arizona usually at altitudes between 1800 and 2000 m.

The oldest specimens of this variety which I have seen were collected by J. G. Lemmon on the Chiricahua Mountains, Arizona, May, 1881. "Tree 40° high" (No. 156 in Herb. Gray), by Pringle in "rich cañons" of the Santa Rita Mountains, Arizona, in July, 1881, and by Rusby (No. 2159) on the Mogollon Mountains, New Mexico, in August, 1881.

### Aesculus

**Aesculus glabra** Willd. The leaves of the type of this tree as described by Willdenow (Enum. Pl. 405 [1809]) are "glaberrima." The type was a tree cultivated at Berlin, and wild trees with entirely glabrous leaves occur, but appear to be extremely rare, and are found chiefly in the region east of the Mississippi River. Usually the leaflets are furnished below with conspicuous tufts of axillary hairs, and westward their lower surface is often covered in early spring with loose, floccose hairs which are most abundant on the midrib and veins, and usually disappear before the beginning of the summer. More distinct is a form with leaflets thickly covered below with close, dense pubescence, persistent during this season. What is evidently this form was described as *Aesculus pallida* by Willdenow (l. c. 406) who says of it "Folia subtus pubescentia et ut in *A. Pavia* atque *flava* in axillis venarum fasciculo pilorum instructa, quum praecedentis [*A. glabra*] folia semper glaberrima sint." This form, although it differs from the type only in the pubescence of the leaves and young branchlets, is probably best considered a variety, especially as it is found only in a comparatively restricted area. Treated as such it becomes:

**Aesculus glabra** var. **pallida** Kirchner in Petzold and Kirchner, Arb. Musc. 166 (1864).

The only specimens of this variety which I have seen are the following:

**IOWA.** Indianola, Warren County, and Moringona, Boone County, *L. H. Pammel*, August and September, 1912.

**MISSOURI.** Hannibal, Marion County, *J. Davis* (No. 2136), September, 1913; Galena, Stone County, *E. J. Palmer* (No. 5706) May, 1914; Eagle Rock, Barry County, *E. J. Palmer* (No. 6286) July, 1914.

**ARKANSAS.** Winslow, Washington County, *E. J. Palmer* (No. 8263) July, 1915.

It is interesting that the variety of *A. glabra* with usually seven leaflets (var. *Buckleyi* Sarg.) from Jackson County, Missouri, the type locality, is pubescent, that a specimen of this variety from eastern Kansas is nearly glabrous and that specimens from Ohio and Mississippi are glabrous.

**Aesculus octandra** Marsh. As long ago as 1856 Asa Gray in the third edition of his Manual described a var. *purpurascens* of this species. He referred to his variety *Aesculus discolor* of Pursh as a synonym and gave the range from W. Virginia southward and westward. The flowers (both



calyx and corolla) were described as tinged with flesh color or deep purple and the leaflets as commonly downy below. This description was probably based on specimens of *Aesculus discolor* of Pursh, for Gray had no specimen of a red-flowered *Aesculus octandra* in his herbarium. The confusion about a red-flowered Appalachian Buckeye was increased in the second volume of the *Silva* of North America in which I proposed the name *Aesculus octandra* var. *hybrida* for a tree said to be not rare on the Appalachian Mountains. The description, however, was that of *Aesculus discolor*, and *Aesculus hybrida* DC; a hybrid between *Aesculus octandra* and *A. Pavia* which appeared in Europe more than a century ago, was thought to be the Appalachian tree. Who started the story that a red-flowered Buckeye grew on the Mountains of Virginia, I do not know. For many years I have been looking for it in the field and in herbaria. I thought I had found it at Mount Vernon among the trees which Washington planted about 1785 and which were believed to have been raised from seeds which he had gathered near the mouth of Cheate River, West Virginia. I am now satisfied that these trees are hybrids between *Aesculus Pavia* or *Aesculus discolor* and some species with petals ciliate on the margins. They could not have come from seeds gathered in West Virginia. *Aesculus discolor* and *A. Pavia* do not, so far as I know, grow in West Virginia and *A. octandra* does not grow in any part of the country near *Aesculus Pavia* or *A. discolor*. *Aesculus discolor* does, however, grow with or near *Aesculus georgiana* in northern Georgia and it is possible that the elder Michaux or John Bartram whom Washington consulted about his trees may have given him nuts brought from South Carolina or Georgia which produced the Mount Vernon trees. This theory is possible, but hardly probable; and the Mount Vernon Buckeyes present a problem which I am unable to solve. That they are hybrids the mixture of hairs and glands on the margin of the petals seems to show.

That the story, whoever may have started it, of a red-flowered form of *Aesculus octandra* on the mountains of West Virginia is true is now shown by specimens in this herbarium collected on May 17, 1919, in the neighborhood of White Sulphur Springs, Greenbrier County, by Mr. John S. Ames, who went specially to West Virginia to look for this tree. He was fortunate in finding several trees with red flowers and others with pink and cream-colored flowers growing with the typical yellow-flowered trees. This red-flowered form of *Aesculus octandra* is without a name, for the var. *purpurascens* Gray is *Aesculus discolor* Pursh by description and synonymy and the var. *hybrida* Sarg. is a confusion of the hybrid *Aesculus hybrida* DC. and *Aesculus discolor* Pursh. and I suggest that it be called

*Aesculus octandra* var. *virginica*, n. var.

Differing from the type only in the red, pink or cream-colored flowers.

*Aesculus georgiana* Sarg. The type of this species was found in the neighborhood of Stone Mountain, DeKalb County, Georgia, where it is common as a broad shrub from 1-2 m. high. The flowers which are produced in short, compact clusters, have a red and yellow calyx and red pet-



als ciliate on the margin. This species which is easily distinguished from *Aesculus octandra* by the absence of glandular hairs on the calyx and pedicel is now known to be widely distributed in the Piedmont regions from North Carolina to northern Georgia, and to occur on the banks of the Savannah River near Augusta, Richmond County, Georgia, in northern Alabama (Madison, Etowah and Tuscaloosa Counties) and near Pensacola, Escambia County, Florida. It is sometimes a shrub but often a slender tree from 10 to 15 m. high. The flowers are sometimes red and yellow, often yellow and occasionally bright red. The inflorescence which is short, broad and densely flowered in the type, is sometimes narrow and more elongated with less crowded flowers. The calyx which is normally campanulate varies considerably in shape and is occasionally tubular, the two forms sometimes appearing in the same inflorescence. The var. *pubescens* Sarg. distinguished by the pubescence on the lower surface of the leaves, known first only from the neighborhood of Stone Mountain proves also to be widely distributed and occasionally arborescent in habit. This variety is common in the woods west of Augusta and occurs in Rabun and Floyd Counties, Georgia; in North Carolina it ascends on the Blue Ridge to altitudes of about 1000 meters and ranges northward in the Piedmont region to Orange County; southward it is not rare with the species in northern Alabama. A form with narrow leaflets may be distinguished as

*Aesculus georgiana* var. *lanceolata*, n. var.

Differing from the type in its narrow-lanceolate or slightly oblanceolate leaflets.

Leaves 5-foliolate with glabrous petioles 9–12 cm. in length; leaflets lanceolate to slightly oblanceolate long-acuminate at apex cuneate at base, finely serrate with incurved gland-tipped teeth, when the flowers open early in May thin, yellow-green above, pale below, glabrous with the exception of occasional hairs on the under side of the slender midrib and of minute axillary tufts, 13–18 cm. long and 3–4 cm. wide, their petiolules 5–8 mm. in length. Flowers bright red, otherwise as in the type, in a narrow panicle 15 cm. in length. Fruit not seen.

A tree 8–10 m. high with a short trunk 15–20 cm. in diameter, erect branches forming a narrow head and slender, glabrous branchlets.

GEORGIA. Rabun County, T. G. Harbison (No. 19 type) May 9, 1917.

× *Aesculus Bushii* Schneid. (*A. discolor* var. *mollis* Sarg. × *A. glabra* var. *leucodermis* Sarg.)

To this hybrid which was found several years ago near Fulton, Hempstead County, Arkansas, should probably be referred a tree found near Starkville, Oktibbeha County, Mississippi, by T. G. Harbison (No. 1055) April 7, 1913. From the type of *A. Bushii* the Mississippi tree differs in its rather more pubescent and less coarsely serrate leaflets, in its longer and narrower inflorescence, and in its narrower red calyx and darker red petals.

*Aesculus discolor* var. *mollis*, *A. Pavia* and the typical form of *A. glabra* are the only Buckeyes which grow in Oktibbeha County. The mixture of



hairs and glands on the margin of the petals indicate the hybrid origin of the Harbison plants and the pubescent under surface of its leaflets point to *A. discolor* var. *mollis* rather than to *A. Pavia* as one of the parents of this hybrid.

× *Aesculus mississippiensis* (*A. glabra* × *A. Pavia*), n. hybr.

Leaves 5-foliolate with petioles slightly pubescent toward the apex on the upper side and 8–10 cm. in length; leaflets elliptic to oblong-obovate, acuminate and often abruptly pointed at apex cuneate or rounded and often unsymmetric at base, finely often doubly serrate with incurved gland-tipped teeth, glabrous with the exception of short hairs scattered on the upper side of the lower part of the midrib and of small tufts of axillary hairs, 9–10 cm. long, 4–5 cm. wide, and sessile or raised on a short pubescent petiolule. Flowers appearing early in April in puberulous panicles 8–10 cm. in length on slender slightly pubescent pedicels, 6–8 mm. long; calyx narrow-campanulate, red, glabrous, the lobes ciliate on the margin; petals dark red or yellow, pubescent furnished on the margin with hairs and glands. Fruit slightly and irregularly tuberculate; seed 2–3 cm. in diameter, dark chestnut-brown with a small hilum.

A tree 6 to 7 m. high with a trunk 16 cm. in diameter and slender glabrous branchlets.

MISSISSIPPI. Low woods; near Brookville, Noxubee County, *T. G. Harbison* (Nos. 1061, type and 1061 A), April 8, and October, 1913.

The mixture of hairs and glands on the margin of the petals of this tree indicate that it is a hybrid of a species of the subsection Octandrae with one of the Eupaviae. Of the former subsection only *A. glabra* grows in southern Mississippi where both *A. Pavia* and *A. discolor* var. *mollis*, of the Eupaviae are common; and the general absence of pubescence from the leaflets of the hybrid point to *A. Pavia* as its other parent. Two specimens collected at Starkville, Oktibbeha County, Mississippi, by *T. G. Harbison* (Nos. 1054 and 1056) April 7, 1913, with rather larger flowers, probably represent the same hybrid.

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## NEW SPECIES, VARIETIES AND COMBINATIONS FROM THE HERBARIUM AND THE COLLECTIONS OF THE ARNOLD ARBORETUM <sup>1</sup>

ALFRED REHDER

ROSACEAE (*continued*)

*Prunus* L.

× *Prunus arnoldiana*, hybr. nov. (*P. cerasifera* × *triloba*).

Frutex 2-metralis v. ultra, ramosissimus, satis densus, ramis patentibus divaricatis; ramuli annotini glabri, plerumque virides, annotini fuscorubri; gemmae ovatae, parvae, pleraeque stipulis paucis praeditae. Folia

<sup>1</sup> Continued from p. 62.



elliptica vel ovato-elliptica vel inferiora interdum obovata acuta, basi cuneata, 3–6 cm. longa et 1.7–3 cm. lata, crenato-serrata dentibus late ovatis abrupte acuminulatis, interdum leviter dupliciter serrata, supra sparse adpresse pilosula, subtus sparse, ad nervos densius villosa, utrinsecus nervis 5–8; petioli 0.4–1 cm. longi, sparse villosi, apice plerumque glandulis 1–3 instructi; stipulae subulatae, glanduloso-serrulatae, basi lobulis 1–2 instructae. Flores solitarii, coetanei, albi, in alabastro colore roseo suffusi, fere 2.5 cm. diam.; pedicelli circiter 5 mm. longi, glabri; calyx late campanulatus, extus glaber, intus supra medium villosulus; sepala ovalia, obtusa, serrulata, extus glabra, intus villosula, sub anthesi reflexa, tubum fere aequantia; petala ovalia, 11–13 mm. longa; stamina circiter 30, petalis breviora; ovarium villosum; stylus staminibus paullo brevior. Fructus subglobosus, ruber, sparsissime villosus; putamen globoso-ovoideum, 12 mm. longum et 11 mm. latum, compressum, carinatum, leviter punctat rugulosum.

Cultivated at the Arnold Arboretum sub no. 3176–5 (raised from seed of *P. triloba* in 1902); specimen collected May 9, 1914, Aug. 14, 1915 (fruit), May 23, 1917, May 3, 1919, September 11, 1920.

This hybrid originated in 1902 at the Arnold Arboretum from seed of a plant of *P. triloba* derived in the second generation from seed sent by Dr. Bretschneider in 1884 from the mountains near Peking. It differs from *P. triloba* chiefly in the white flowers coming out with the first young leaves, the longer pedicels, the reflexed calyx-lobes pubescent inside, in the stamens exceeding the style, the generally elliptic, less coarsely and scarcely doubly serrate leaves, in the longer petioles, the larger more succulent and less hairy fruit with a more compressed sharply keeled stone, and in the shorter stipules of the winter-buds. From *P. cerasifera* Ehrh. which blossoms at about the same time and is apparently the other parent, it differs in the red-brown color of the one year old branchlets, in the shorter pedicels, the villous ovary, the larger and broader sometimes obovate and more pubescent leaves with coarser more acute teeth and in the slightly hairy fruit with a more globose stone. It is interesting as being a hybrid between species of the subgenera *Amygdalus* and *Prunophora*, and is to my knowledge the first known hybrid between these two subgenera.

*Prunus arnoldiana* is a handsome freely and early flowering shrub of rather dense habit. From *P. cerasifera* it differs in its more compact shrubby habit and from *P. triloba* in its more numerous white flowers.

*Prunus Meyeri*, sp. vel hybr. nov. (? *P. Maackii* × *Maximowiczii*.)

Arbor pyramidalis ramis patentibus, ramulis junioribus puberulis, annuinis purpureo-fuscis, ramis vetustioribus aurantiaco-brunneis lucidis laevibus lenticellis magnis horizontalibus notatis, cortice trunci brunneo longitudinaliter fisso; gemmae ovoideo-conicae, brunneae, glabrae, pauci-perulatae. Folia ovata v. elliptico-ovata ad ovato-oblonga, acuminata, basi pleraque<sup>1</sup> rotundata, 4–8 cm. longa et 3–5 cm. lata, eaturionum pleraque oblongo-ovata et ad 14 cm. longa et fere ad 6 m. lata, dupliciter ad subsimpliciter serrata dentibus triangulari-ovatis acutis, supra glabra, laete



viridia, subtus ad costa densius, ad nervos sparsius pilosa, ceterum glabra, sed glandulis fuscis conspersa; petioli pubescentes, 1–1.5 cm. longi. Racemi multiflori, pedunculo bracteis foliaceis instructo incluso 5–6 cm. longi, pubescentes; pedicelli sparse pubescentes, inferiores 0.6–1 cm. longi, apicem versus decrescentes, bracteis dimidium pedicellum plerisque superantibus lanceolatis v. lineari-lanceolatis glanduloso-denticulatis inferioribus saepe latoribus et foliaceis suffulti; calyx extus sparse pilosus, lobis triangularibus sparse glanduloso-denticulatis tubo paullo brevioribus; petala oblongo-obovata, circiter 7 mm. longa; stamina petalis et stylo paullo longiora. Fructus ignoti.

Cultivated at the Arnold Arboretum (raised from seed collected by F. N. Meyer in northern Korea in 1906 and received from the U.S. Department of Agriculture under No. 20084 [F. N. Meyer, No. 352a]); specimens collected, May 18, 1918, and June, and September 14, 1920.

*Prunus Meyeri* seems in all its characters intermediate between *P. Maackii* Rupr. and *P. Maximowiczii* Rupr. and is probably a hybrid between these species, both of which grow in northern Korea and in the same regions, as specimens collected by Mr. Wilson on the Tumen-Yalu divide on two subsequent days show. From *P. Maackii* the supposed hybrid is easily distinguished by the darker and close, not flaky, bark, by the much coarser and double serration of the leaves with acute, not setosely acuminate teeth, by the longer peduncles furnished with bracts, the much larger bracts at the base of the pedicels and by the shorter style. From *P. Maximowiczii* it differs chiefly in the lustrous orange-brown bark of the branches, in the larger leaves glandular-punctate beneath, in the many-flowered racemes with smaller and narrower bracts, in the smaller flowers and in the less densely pubescent calyx and pedicels. If this *Prunus* really is a hybrid, it is like the preceding a hybrid between species of two different subgenera, for *P. Maximowiczii* belongs according to Koehne to the subsect. *Phyllomahaleb* of the subgen. *Cerasus*, while *P. Maackii* belongs to the Ser. *Maackiopadus* of the subgen. *Padus*, though the two groups may be more closely related in spite of Koehne's classification.

Our tree which is now about 6 meters tall with a trunk 12 cm. in diameter has flowered well for several years, but has so far produced no fruits and in this respect resembles *P. Maackii* which in this Arboretum fruits very sparingly while *P. Maximowiczii* is usually well covered with its purple-black lustrous fruits. Though its flowers are not conspicuous *P. Meyeri* is a desirable ornamental tree on account of its vigorous growth, its dense pyramidal habit and its pleasing bright green foliage. The orange-brown lustrous bark of its limbs and branchlets make it attractive in winter.

*Prunus Padus* L. var. *laxa*, var. nov.

A typo varietatis recedit ramulis gracilibus laxe pendulis foliis angustioribus plerisque obovato oblongis, axillis nervorum subtus ebarbatis, racemis laxis pendulis, putamine minore laeviore vix foveolato. — Arbor glabra ramis patentibus, ramulis junioribus basi tantum minute puberulis: folia elliptico-obovata v. oblongo-obovata, 5–10 cm. longa et 3–4.5 cm. v.



rarius ad 5 cm. lata, acuminata, basi abrupte contracta et glandulis 2 notata, argute serrulata, ea turionum saepe grossius et obtuse serrata, subtus glaberrima, laete vel pallide viridia; petioli graciles, 1–1.8 cm. longi; racemi laxi, pedunculo folia pauca et parva interdum decidua gerente incluso 10–13 cm. longi; flores 1.4 cm. diam; pedicelli 6–13 mm. longi, graciles; petala orbiculari-ovalia, manifeste eroso-denticulata: fructus parvi, purpureo-nigri; putamen 6 mm. longum, costis elavatis brevibus a carina abeuntibus notatum, in media facie fere laevi vel in No. 20078 totum fere laeve.

Cultivated at the Arnold Arboretum (raised from seed collected by F. N. Meyer in northern Korea in 1906 and received from the U.S. Department of Agriculture under Nos. 20082 and 20078; specimens collected: May 6 and Sept., 1915; May 8 and July 25, 1918 (No. 20082 [F. N. Meyer, No. 350a], type); May 8 and July 25, 1918 (No. 20078 [F. N. Meyer, No. 346a])).

This new variety is nearest to *P. Padus* var. *commutata* Dipp. and is perhaps only a form of it; it differs chiefly in its loose pendulous habit, the rather narrow, generally oblong-obovate, quite glabrous leaves, the elongated lax racemes and the much smoother or nearly smooth stone. I have seen no specimen of *Prunus Padus* neither of the European type nor of any of the Asiatic forms with such a smooth stone, except perhaps Wilson's No. 8946 from North Kankyo, the most northern province of Korea. The two plants representing this variety in this Arboretum differ in the stone which is ribbed toward the margin in No. 20082 and nearly smooth in No. 20078, in the petals which are fringed in No. 20082 and nearly entire in No. 20078, and in habit which is looser and more pendulous in No. 20082. The other pendulous form of *P. Padus*, the European *P. Padus* f. *pendula* Hartwig, may be distinguished chiefly by its stouter branchlets, the broader more closely serrate leaves glaucescent beneath, the larger leaves at the base of the racemes, the obovate petals and by the deeply sculptured stone.

Of the other varieties of *P. Padus* occurring in Korea var. *glauca* Nakai differs in the glaucous and var. *pubescens* Regel in the pubescent underside of the leaves, and var. *seoulensis* Nakai in the longer pedicels up to 2 cm. in length, in the long leafy peduncle and in the longer-acuminate leaves.

Two other varieties of *P. Padus* collected by F. N. Meyer in northern Korea were received from the Department of Agriculture, namely, No. 20077 (F. N. Meyer No. 345a) which is *P. Padus* var. *commutata* Dipp., and No. 20079 (F. N. Meyer No. 347a) which is *P. Padus* var. *pubescens* Regel, a variety new to cultivation, as far as I know.

#### ARALIACEAE

*Acanthopanax ternatus*, sp. nov.

Frutex bimetralis vel altior, glaber; rami patenti-erecti, satis tenues, pallide cinerei vel brunneo-cinerei, sparse lenticellati, aculeis paucis 4–6 mm. longis validiusculis basi valde dilatatis rectis vel leviter curvatis saepissime geminis et infrapetiolaribus armati vel saepe inermes; gemmae ovoideae, acutiusculae, 1.5–2 mm. longae, brunneae. Folia decidua, petiolata,





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