

NOTES ON NORTH AMERICAN TREES. V<sup>1</sup>

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*Populus tacamahacca* Mill. — This name has recently been taken up<sup>2</sup> for the Balm of Gilead or Ontario Poplar, *Populus candicans* Ait. Miller's description, however, of *Populus tacamahacca*, "foliis subcordatis, inferne incanis," applies equally well to the common Balsam Poplar of northeastern North America. In his detailed description Miller speaks of the leaves as "differing from each other in shape and size, most of them almost heart-shaped, but some are oval and rather nearer to spear-shaped. In the Balsam Poplar the leaves vary from ovate to lanceolate, and are subcordate, rounded or cuneate at base, and are not broad-ovate, deeply cordate and abruptly pointed at apex, as are the leaves of *P. candicans* Ait. Miller describes the staminate flowers of his *P. tacamahacca*, but as only pistillate trees of *P. candicans* have been seen, his description of the staminate flowers cannot apply to that species. According to Aiton *P. candicans* was not introduced into England until about 1772, or fourteen years after Miller's description of his *P. tacamahacca* was published. The evidence certainly seems to show therefore that Miller included in his description of *Populus tacamahacca* the different forms of the Balsam Poplar which all authors but Miller have called *P. balsamifera* and for which Miller's name should be adopted.

With the material found in herbaria which I have seen it has not been possible to determine the western range of *Populus tacamahacca*, for without the pistillate flowers or the fruit it is impossible to distinguish this species from the western *P. trichocarpa* Torr., and specimens with leaves only collected in Montana, Idaho, northern California and on the coast of Alaska can be equally well referred to one of these species as to the other.

*Populus tacamahacca* var. *Michauxii* Farwell in *Rhodora*, XXI. 101 (1919). — *P. candicans* Sargent, *Silva N. Am.* IX. t. 490, f. 1, 2 (staminate flowers), (1896), not Aiton. — *P. Michauxii* Dode, *Extr. Monog. Ined. Populus*, 62, (1905). — *P. balsamifera* var. *Michauxii* A. Henry, *Gard. Chron. ser. 3*, LIX. 230 (1916). — This is a common northern variety with cordate or subcordate leaves slightly pilose on the under side of the midribs and veins, and distributed from Aroostook County, Maine, to the Province of Quebec, Newfoundland and the shores of Hudson Bay.

*Populus acuminata* var. *Rehderi*, n. var.

A typo recedit foliis majoribus plerisque longius petiolatis, ramulis junioribus et gemmis pubescentibus, fructibus minoribus.

A large tree with smooth gray or greenish yellow bark, becoming deeply

<sup>1</sup> The preceding parts of this series have appeared in *Botanical Gazette*: I. *Quercus*. (LXV. 423-459. 1918). — II. *Carya*. (LXVI. 229-358. 1918). — III. *Tilia*. (LXVI. 428-438, 494-511. 1918). — IV. (LXVII. 208-242. 1919).

<sup>2</sup> Farwell in *Rhodora*, XXI. 101, 1919.

furrowed on old trunks. Leaves 8–11 cm. long and 6–7 cm. wide, their petioles up to 7 cm. in length. Fruit 3–5 mm. long in crowded aments 6–7 cm. in length.

DISTRIBUTION. River banks, Silver City, Grant County, New Mexico, *A. Rehder*, August 10, 1914 (No. 275); *Alice Eastwood*, April and May, 1919 (Nos. 8175, 8176, 8178, 8179, 8201, 8296, 8345, 8347, 8348, 8356, 8357, 8358, 8379, 8383 [type], 8384, 8393, 8423, 8424, 8433, 8453, 8455, 8456, 8479. River banks near Fort Whipple (Nos. 8831 and 8841) and Prescott (Nos. 8853 and 8854), Yavapai County, Arizona, *Alice Eastwood*, May, 1919.

***Populus Fremontii* var. *macrodisca*, n. var.**

A typo recedit disco lato et alto capsulam fere includente.

A tree with glabrous branchlets, reddish brown when they first appear, becoming light yellow-brown in their first winter. Leaves broad-ovate, abruptly long-pointed and acuminate at apex, subcordate at the broad base, and gradually narrowed and cuneate to the insertion of the petiole, coarsely crenately serrate, glabrous, 7–9 cm. long and broad; petioles slender, 5–8 cm. in length. Fruit in aments 10–12 cm. long, ellipsoidal, rounded at the ends, 7–8 mm. long, enclosed to above the middle or nearly to the apex in the broad cup-like disk slightly undulate on the margins; pedicels 2–3 mm. long.

DISTRIBUTION. Near Silver City, Grant County, New Mexico, *Alice Eastwood*, May, 1919 (Nos. 8429 [type], 8435).

In the peculiar shape of the base of its leaves this variety resembles *Populus Fremontii* var. *Toumeyi* Sargent which has been collected by Miss Eastwood in the neighborhood of Silver City, but the leaves are larger. The size of the disk under the fruit distinguishes this tree from all other American Poplars.

*Populus balsamifera* Linnaeus, Spec. 1034 (1753). — *P. angulata* Michaux f., Hist. Arb. Am. III. 302, t. 12 (1813). — *P. angulata* var. *missouriensis* A. Henry in Elwes & Henry, Trees of Great Britain, VII. 1811 (1913). — *P. deltoidea* var. *missouriensis* A. Henry in Gard. Chron. ser. 3, LVI. 46 (1914).

The fact has long been known to students of American trees that the *Populus balsamifera* of Linnaeus was one of the Cottonwoods and not the Balsam Poplar of northeastern North America for which Linnaeus's name has long been used, but it is only recently that the correct application of the name has been suggested in print.<sup>1</sup> Linnaeus based his species on the *Populus nigra*, folio maximo, gemmis balsamum odoratissimum fundentibus of Catesby (*Hist. Nat. Car.* I. 34, t. 34). Catesby's specimen from which his figure was made is preserved in the British Museum and through the courtesy of Dr. Rendle the Arboretum possesses an excellent photograph of this specimen which must be taken as the type of *P. balsamifera* Linnaeus. It does not represent the common Cottonwood of the eastern states but a tree which, although widely distributed, is now rare and local. The leaves

<sup>1</sup> Farwell in *Rhodora*, XXI. 101 (1919).



are ovate, longer than broad, abruptly acuminate at apex, subcordate or rarely truncate at base, finely crenately serrate, 12–15 cm. long and 10–12 cm. wide. The flowers and fruit do not differ from those of the common Cottonwood, and the angular branchlets, which have often been considered a specific character of this tree, have no significance for such branchlets occur on all forms of *P. balsamifera* and on the Rocky Mountain *P. Sargentii*.

I have seen specimens of *P. balsamifera* from the shore of Lake Champlain at Shelburne Point, Chittenden County, Vermont; near Rochester, Munroe County, New York; from an island in the Delaware River above Easton, Northampton County, Pennsylvania; North Bend on the Ohio River, Hamilton County, Ohio; banks of the Potomac River opposite Plummer's Island, about Bare Hills and near Copper Mine, Baltimore County, Maryland; banks of the Chattahoochee River at Columbus, Muscogee County, Georgia; River Junction, Gadsden County, Florida; Starkville, Oktibbeha County, and Artisia, Lowndes County, Mississippi.

The *Populus angulata* of the younger Michaux, although he did not describe or figure the staminate flowers, is probably the *P. balsamifera* of Linnaeus, but it is impossible to determine if the *P. angulata* of Aiton is the *P. balsamifera* of Linnaeus or the tree now cultivated in Europe as *P. angulata*, on which the scales of the flowers are dentate, not fimbriate at apex. Trees with such scales have not been found growing wild in the United States, and it is possible that all the trees with these peculiar scales have been propagated from one abnormal individual. For the common Cottonwood of the eastern states, which differs only from *P. balsamifera* of Linnaeus in its smaller ovate-deltoid leaves, the following name can be adopted:

*Populus balsamifera* var. *virginiana*, n. comb.

*P. deltoidea* Marshall, Arbust. Am. 107, 106 (1785), at least in part. *P. nigra*  $\beta$ . *virginiana* Castiglioni, Viag. negli Stati Uniti, II. 374 (1790). — *P. deltoidea* var. *angulata* Sargent, Trees and Shrubs, II. 212 (1913), in part.

The leaves of northern trees of this variety are quite glabrous, but south of the Potomac and Ohio Rivers many individuals occur on which the under side of the midribs and principal veins are pilose, especially early in the season. This form, which is probably the *P. angulata* var. *missouriensis* A. Henry in part and the *P. deltoidea* var. *angulata* Sargent in part, may be called

*Populus balsamifera* var. *pilosa*, n. nom.

*Betula papyrifera* var. *elobata*, n. comb. — *B. alba* var. *elobata* Fernald in Rhodora, xv. 169 (1913).

*Betula papyrifera* var. *occidentalis*, n. comb. — *B. occidentalis* Hooker, Fl. Bor. Am. II. 155 (1839). — *B. papyracea* var. *occidentalis* Dippel, Laubh. II. 177 (1892). — *B. Lyalliana* Koehne in Mitt. Deutsch. Dendr. Ges. VIII. 53 (1899), nom. nud. — *B. papyrifera* var. *Lyalliana* Koehne apud Schelle in Beissner, Schelle & Zabel, Handb. Laubholz.-Ben. 55 (1903).

*Betula papyrifera* var. *subcordata*, n. var. — *B. subcordata* Rydberg apud Butler in Bull. Torrey Bot. Club, xxxvi. 496, f. 15 (1909).



This variety of the Canoe Birch differs from the type in the slightly cordate or rounded base of the leaves which are acute on the type specimen but are as often acuminate or abruptly acuminate as acute; the spreading teeth of the leaves, which have been used to distinguish this tree, more often point forward and appear to have no specific importance. The bark separates in thin layers and is usually white but is sometimes on occasional trees dark red-brown or orange color.

This is the common White Birch of the northern Rocky Mountain region from Alberta to northern Montana and Idaho, and westward to eastern Washington, Oregon and British Columbia where it grows with the var. *occidentalis* Sarg. from which it differs chiefly in its smaller leaves subcordate or rounded at base, and its usually smaller strobiles. The leaves of the var. *occidentalis* Sarg. are rounded or cuneate at base, and only rarely cordate usually only on vigorous shoots. The color of the bark, as in *B. papyrifera* and its varieties, differs on different individuals from white to reddish brown and to orange color.

Much reliance has been placed on the color of the bark for distinguishing species among the Canoe Birches which cross the continent in the north, but late collections indicate that this character cannot be depended on. The pubescence on the leaves and branchlets do not furnish specific characters in this group, and the shape of the scales of the mature strobiles, which usually vary in all species of *Betula*, cannot be used to separate successfully the different varieties of the Canoe Birch as here considered.

*Betula papyrifera* var. *montanensis*, n. var. — *B. montanensis* Butler in Bull. Torrey Bot. Club, xxxvi. 439, f. 17 (1909).

From other forms of *Betula papyrifera* this variety differs in its thicker, darker green leaves and in the unusually long base of some of the mature scales under the nutlets which below the middle of the strobile is rather more than twice the length of the expanded upper part of the scale, while near the apex of the strobile it is only about as long. The leaves of the type of *B. montanensis* from Yellow Bay on the eastern shore of Flathead Lake, Montana, are represented as broadly ovate, truncate at base and acute at apex; and the bark of this tree is described as of the same bronze color as that of *B. occidentalis* but "is dull, never peeled, and is always mottled with gray." What is evidently the same variety was collected by *J. G. Jack* September 13, 1919, at Sandpoint, Bonner County, Idaho, where close to the railroad station are growing a number of trees 14–17 m. tall with white bark. On one of the two branches collected by Mr. Jack the leaves resemble exactly the leaf of *B. montanensis* as figured in the Bull. Torrey Bot. Club, but on the fruiting branch of the same tree the leaves are all coarsely doubly serrate, long-pointed and acuminate, and vary from broad-ovate with a rounded base to oblong-ovate or lanceolate, and narrowed and rounded at base, and are 10–12 cm. long and 4–5 cm. wide. The branchlets during the first season are puberulous. In the stoutness of the mature catkins and in the shape of their scales, and in the shape and thickness of the leaves this appears the most distinct of the different forms of the Canoe Birch.



*Betula fontinalis* Sarg. — The type of this species is from Manitou, Colorado, on the eastern foothills of the Rocky Mountains. The strobiles of some of the Manitou plants are 4 cm. long and 10 or 12 mm. in diameter; on other plants in the same locality the strobiles are only 2.5 cm. long and 5 mm. in diameter. Specimens from other parts of Colorado show a similar variation in the size of the strobiles. The length and thickness of the strobiles and the shape of their scales have been used to distinguish *B. Piperi* Britt. from *B. fontinalis*. The longest strobiles of *B. Piperi* are 4 cm. long and 5 cm. thick and are longer than the longest of *B. fontinalis*, but the size of the strobile varies so much on different individuals that it has no value in distinguishing species. The shape of the scales of the strobiles has also been used as a character for distinguishing *B. Piperi* from *B. fontinalis*, those of *B. fontinalis* being described with "lateral lobes ascending or erect, shorter than the middle one," and those of *B. Piperi* with "lateral lobes widely spreading and obtuse, about as long as the narrower acute middle one." These descriptions are true of the scales of some individuals, but, as in other species of *Betula*, the scales vary greatly in shape, and scales of the two forms occur on thick and slender strobiles, and often on the same tree.

*Betula Piperi* is a tree sometimes 16 or 17 m. high, with a tall single stem occasionally 3 dm. in diameter. On the strength of its habit therefore *B. Piperi* had perhaps best be distinguished as

*Betula fontinalis* var. *Piperi*, n. var. — *B. Piperi* Britton in Bull. Torrey Bot. Club, xxxi. 165 (1904).

This appears to be a rare and local tree and to be confined to western Washington where it occurs in the neighborhood of Pullman and Almota, Whitman County, and at Spokane, Lincoln County, where it probably grows to its largest size.

The Birch of this group from California has the short slender catkins of some of the Colorado specimens of *B. fontinalis* and probably should be referred to that species.

I have seen Californian specimens from Sisson, Siskiyou County, *J. G. Jack*, August 26, 1907; Metcalf's ranch, northeast base of Mt. Eddy, Siskiyou County, *A. A. Heller*, No. 12, 133, July 18, 1915 (in Herb. Arnold Arboretum); Upper Sacramento River, Butte County, *W. R. Dudley*, August, 1899; Lone Pine Canyon and Cottonwood Canyon, Inyo County, *E. L. Morris*, April 3, 1905; near Sisson and Salmon Mountains, Siskiyou County, *W. R. Dudley*, August 3, 1899, and August 26, 1901; Upper Sacramento River below Sheldon's Mill, *W. R. Dudley*, August, 1897; Wyand Creek Canyon near Deep Springs Valley, Inyo County, *Roxana*, *S. Ferris*, July 15, 1918; Round Mountain, *J. F. Phares*, August, 1915; Silver Canyon in the White Mountains east of Laws, Inyo County, *A. A. Heller*, No. 8266, May 9, 1906 (all in Dudley Herbarium, Leland Stanford Jr. University).



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