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## A NEW POPLAR (*POPULUS PILOSA*) FROM THE EASTERN ALTAI MOUNTAINS<sup>1</sup>

BY ALFRED REHDER

WITH SUPPLEMENTAL NOTES ON THE DISTRIBUTION AND HABITAT

By R. W. Chaney

### *Populus pilosa* Rehder, sp. nov.

A tree 5–12 m. high; trunk 30–75 cm. in diameter (according to R. W. Chaney); bark deeply fissured, whitish-gray; branchlets (only brachyblasts seen) thick, roughened by closely crowded scars with almost no internodes, densely pilose, glabrescent about the third year, yellowish white, the older marked with rather small blackish lenticels otherwise smooth, yellowish white; buds viscid, pubescent on the outside. Leaves ovate or broadly ovate, 4.5–8 cm. long and 4–6 cm. wide, short-acuminate, more rarely longer acuminate, subcordate at base, or truncate or rounded, slightly crenate, with minutely or indistinctly mucronulate teeth (3–5 to 1 cm.) hairy above on the slightly or scarcely raised midrib and pilose on the veins, more sparsely and finely on the veinlets and the whole surface, paler beneath, white or yellowish white, loosely pilose on the midrib toward the base, moderately densely so on the veins, otherwise glabrous or nearly glabrous; petioles subterete, 1–2.5 cm. long, densely yellowish, pilose. Fruit-bearing aments subsessile, 5–8 cm. long, dense; rhachis pilose; bracts wider than long, fimbriate-laciniate and glabrous; capsules sessile, globose-ovoid, with pubescent, subcrenate disc 4–5 mm. in diameter; valves round-ovate, 4.5 long and 3.5 wide, abruptly short-acuminulate at apex, pubescent on the outside.

Mongolia: Baga Bogdo, Altai Mts., stream valley and terraces, alt. 1600–2300 m., R. W. Chaney, no. 215, in 1925 (Third Asiatic Expedition Amer. Mus. Nat. Hist.).

### *Populus pilosa* Rehder, sp. nov.

Arbor 5–12 m. alta, trunco 30–75 cm. diam. (fide R. W. Chaney), cortice profunde fissio albido-cinereo; ramuli (brachyblasti tantum adsunt) crassi, cicatricibus arcte congestis asperati internodiis fere nullis, dense pilosi, circiter tertio anno glabrescentes, ochroleuci, vetustiores lenticellis nigrescentibus satis parvis notati ceterum laeves, ochroleuci; perulae viscosae, extus pubescentes. Folia ovata vel late ovata, 4.5–8 cm. longa et 4–6 cm. lata, breviter acuminata, rarius longius acuminata, basi subcordata vel truncata vel rotundata, leviter crenata dentibus minute vel obsolete mucronulatis (3–5 ad 1 cm.) ciliata, supra in costa leviter vel vix elevata et in nervis

<sup>1</sup>Publication of the Asiatic Expeditions of the American Museum of Natural History. Contribution No. ~~999~~ 79

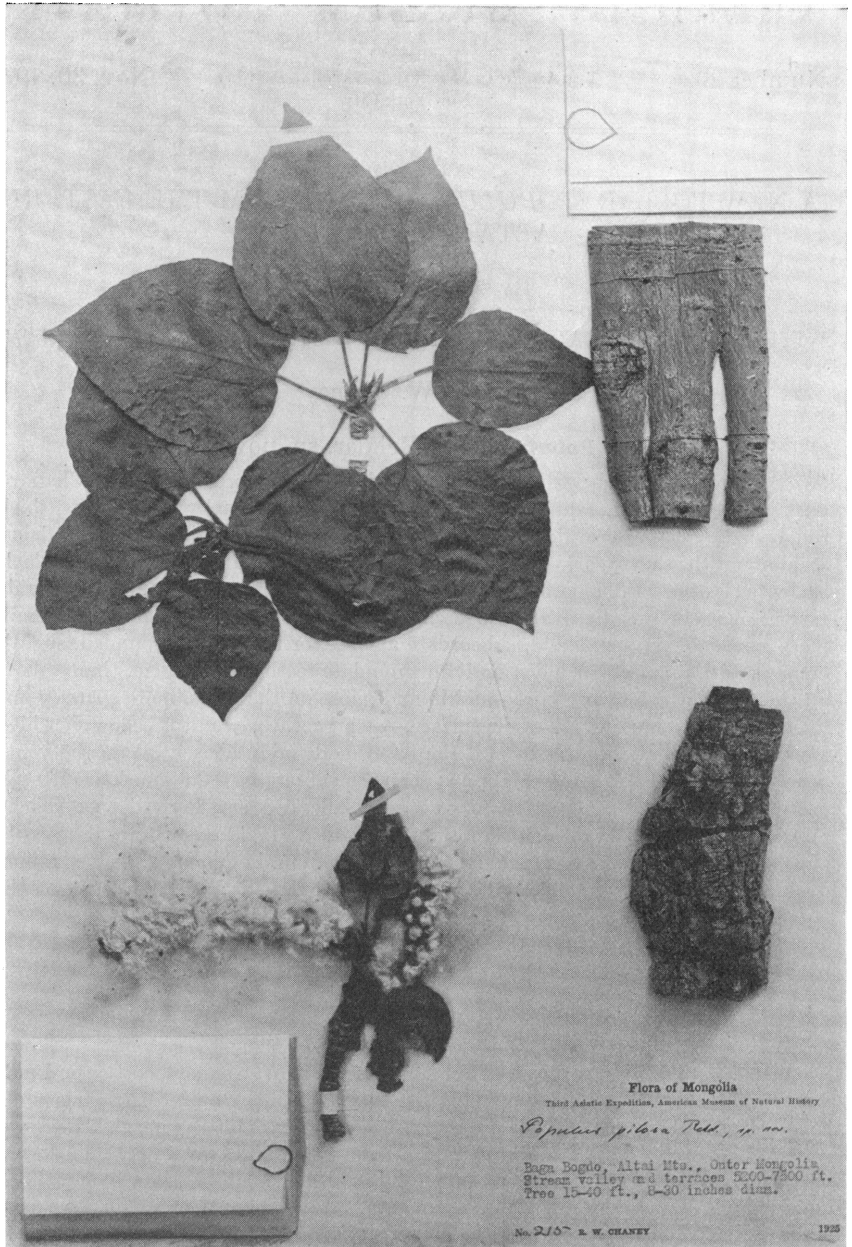


Fig. 1. Photograph of an herbarium specimen showing leaf, bark, and flower of *Populus pilosa*.

pilosa, sparsius et minutius in venulis et facie, subtus pallidiora, albida vel flavido-albida, in costa basin versus satis dense in nervis laxius pilosa, in facie glabra vel fere glabra; petioli subteretes, 1-2.5 cm. longi, dense flavido-pilosi. Amenta fructifera subsessilia 5-8 cm. longa, densa; rhachis pilosa; bractæ latiores quam longæ, fimbriato-laciniatæ, glabræ, capsulæ sessiles, globoso-voideæ, disco pubescente subcrenato 4-5 mm. diam., valvis rotundato-ovatis, 4.5 longæ et 3.5 latæ, apice breviter subito acuminulatis extus pubescentibus.—Affinis videtur *Populo Przewalskii* Maxim. a qua differt præcipue ramulis gemmisque pilosis, petiolis brevioribus dense pilosis vel hirsutis, foliis utrinque ad costam venasque pilosis, et capsulis minoribus.

Mongolia: Baga Bogodo, Altai Mts., stream valley and terraces, alt. 1600-2300 m., R. W. Chaney, no. 215, in 1925 (Third As. Exped. Am. Mus. Nat. Hist.).

This new species belongs in the section *Tacamahaca* and seems most closely related to *P. Przewalskii* Maxim. (*P. suaveoleus* var. *Przewalskii* Schneid.) from which it differs in the pilose branchlets and winter-buds, the densely pilose or hirsute shorter petioles and in the leaves being pilose on midrib and veins on both surfaces; the small subglobose capsules are also a prominent character. It may possibly turn out to be an extreme strongly pubescent form of *P. Przewalskii*, but as I have seen no material of that species, I prefer to consider this Mongolian Poplar a distinct species.

#### NOTES ON THE DISTRIBUTION AND HABITAT OF *POPULUS PILOSA* IN MONGOLIA

By R. W. Chaney

The scarcity of trees in the Gobi desert region is striking evidence of the low rainfall over this great plateau. Elms, *Ulmus pumila*, are numerous on the grasslands bordering the Gobi to the south, but have been noted in only a few cases extending northward for a short distance into the desert proper. A single willow tree, *Salix viminalis* var. *splendens*, was seen in one of the valleys at Ondai Sair. But apart from these, no trees have been noted on the Mongolia Plateau<sup>1</sup> outside of the canyons of the Altai Mountains, a range which extends in a southeasterly direction across the western side of the Gobi desert.

The comparative abundance of trees in the canyons of the Altai Mountains is the result of the greater precipitation there, and the higher degree of protection from evaporation by the winds which are so characteristic of the Gobi proper. Not only are trees more abundant, but plants of all sorts are more numerous and, as observed during the summer of 1925, continue in a green state long after the vegetation of the adjacent

<sup>1</sup>The Arctic Divide to the north, with its comparatively rich forest, is considered to be geographically distinct from the Gobi.

lower country has become dry. We experienced rain on three of the six days spent on Baga Bogdo during the latter part of June, and there was a considerable fall of snow on the peak on June 20th; a month later at Artsa Bogdo there were showers on four of the five days we spent in the mountains. Several of the higher peaks, such as Baga Bogdo and Ikhe Bogdo, have snow on their tops and protected slopes during most or all of the year. This was the case in 1925, and there was ample evidence to indicate that snow had persisted for at least two years in some of the larger canyons. As a result there are permanent streams in these canyons, along which conditions for plant growth are in striking contrast to those of the arid open slopes beyond the canyon mouths. None of the streams were observed to flow beyond the mouths of their canyons before they disappeared by evaporation and by sinking into the coarse gravel and sand of the fans. It was in these canyons and in the upper portions of the fans below their mouths that *Populus pilosa* was collected and observed on Baga Bogdo and Ikhe Bogdo. None were seen on Artsa Bogdo and Gurban Saikhan, the easternmost mountains of the Altai which extend farther out into the Gobi and may be supposed to present less favorable conditions for tree growth. The occurrence in one of the larger canyons on the north side of Baga Bogdo, called Tiger Canyon by members of the Expedition, will here be described as typical of the several similar occurrences on this mountain and on Ikhe Bogdo to the west.

Tiger Canyon in its lower portion is cut into a coarse alluvial deposit, the walls rising steeply some 400 feet to an upper terrace; its width is 2000 feet at the top and a few hundred feet at the bottom. A quarter of a mile above the mouth the canyon is cut into granite and is greatly narrowed with much higher walls. A mile and a half above the mouth metamorphic rocks form a still narrower canyon. The floor is littered with coarse gravel and with boulders up to 20 feet in diameter, and there are numerous terraces which give it an irregular surface. The stream was at most only a few feet in width and less than a foot deep, as observed in June, 1925. It has a high gradient, and the water is clear and cold. Extending for several miles down the side of the mountain below the mouth of the canyon is a broad alluvial fan, cut by numerous dry channels, and littered with gravel and coarse boulders. The stream disappears into the gravel more than a quarter of a mile above the canyon mouth, but its presence in the gravels under the surface of the fan may be inferred from the distribution of trees for more than a mile down the steep slope of the fan below the mouth of the canyon. These trees, all of

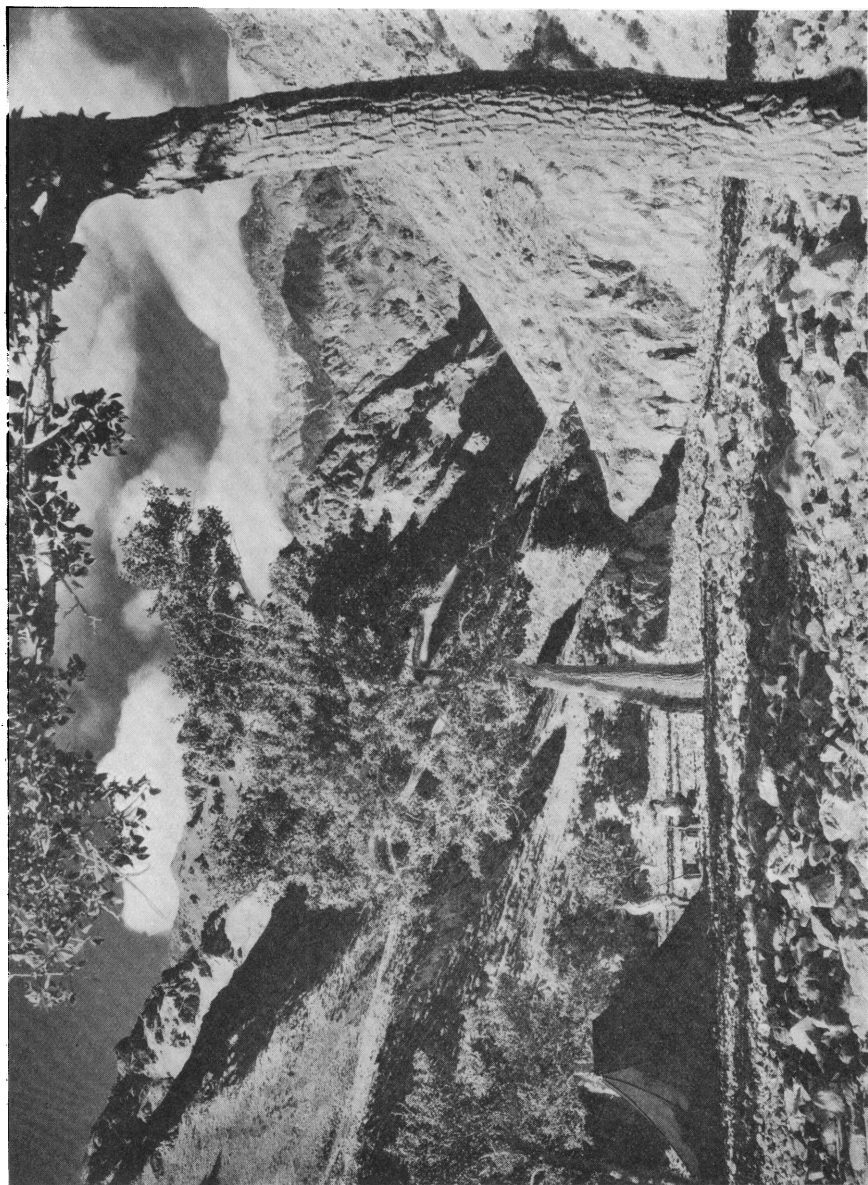


Fig. 2. View of Tiger Canyon showing *Populus pilosa* growing in the steep-sided granite valley.

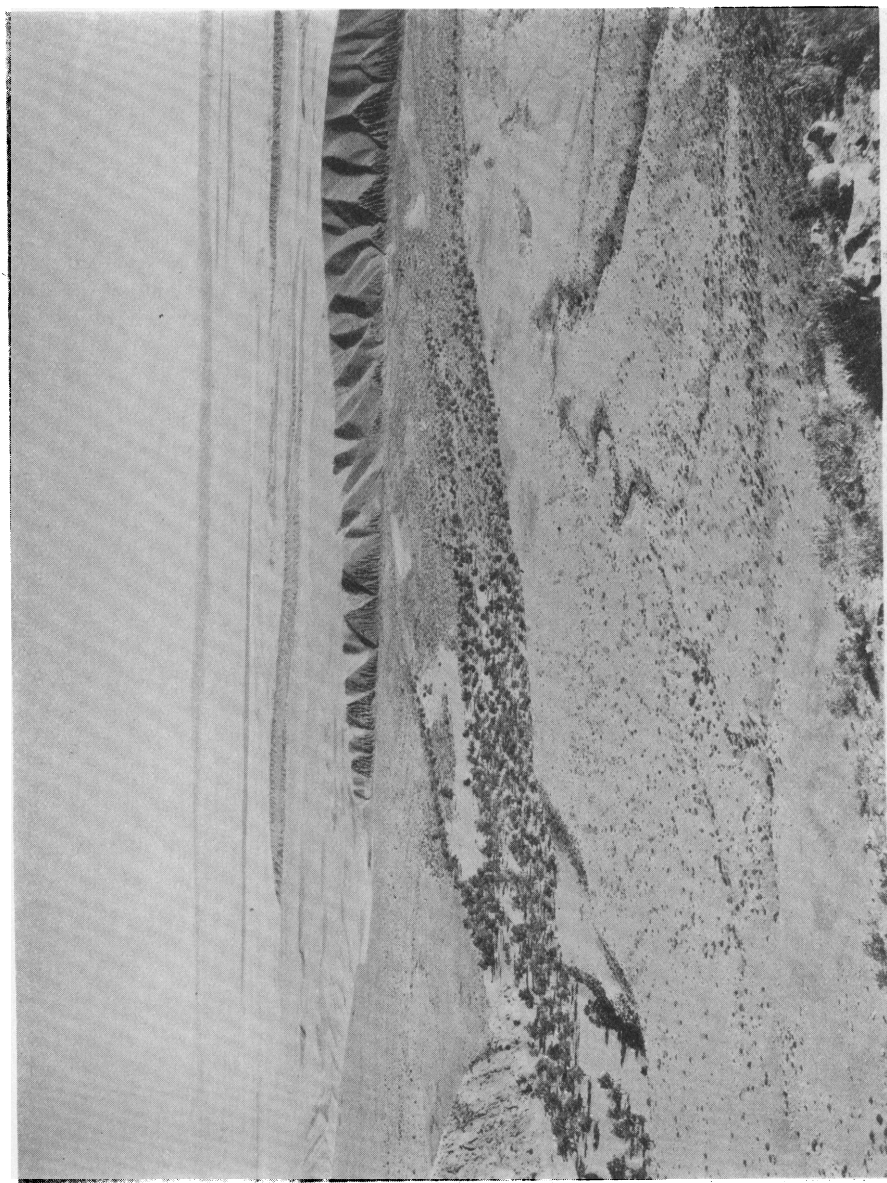


Fig. 3. View northward from Tiger Canyon showing the alluvial fan with scattered trees of *Populus pilosa*.

which are cottonwoods, *Populus pilosa*, are from 15 to 25 feet in height and from 8 to 18 inches in diameter. At the lower end of their distribution (elevation 5200 feet) many are dead, indicating that the supply of water there is inadequate. Except for the trees the fan is essentially bare of vegetation, but along its borders a species of *Artemisia*, as yet undetermined, is abundant together with several species of grass and legumes, and low bushes of *Prunus mongolica*.

In the canyon the trees are more numerous and larger, reaching a maximum height of about 40 feet and a diameter of up to 30 inches. Here the added protection of the canyon walls permits a more symmetrical growth of the trees. They are found along the stream for a distance of at least two miles up the canyon to an elevation of about 7500 feet where it becomes too rocky and narrow for them to gain a footing. Since most of the specific determinations of the flora have not yet been made, a complete and exact list of the associated plants cannot here be given, but it includes *Salix phylicifolia* which reaches the dimensions of a small tree, *S. glauca*, *Cotoneaster melanocarpa*, *Lonicera microphylla*, and *Spiraea chamædryfolia* among the woody plants, the fern *Cystopteris fragilis*, and numerous herbs of which the Leguminosæ and Ranunculaceæ are well represented. No seedlings of *Populus pilosa* were observed in Tiger Canyon or on its fan, but there were a few in the next large canyon to the west where there is also a permanent stream. While trees here are numerous, few of them reach the size of those in Tiger Canyon, the average diameter being little more than 8 inches. No exact count of the trees was made, but it may be conservatively estimated at several hundred in each of these two canyons. In the only large canyon observed at Ikhe Bogdo, the next large range west of Baga Bogdo, the trees were not as numerous and did not extend as far down the fan.

The use of the wood of *Populus pilosa* by the Mongols is abundantly indicated by sawed stumps in Tiger Canyon. Portions of the logs are hollowed out and made into tea mortars and water containers. The Mongol name for this tree, *Toré* meaning hollow, is indicative of this utilization of it by a people whose nearest approach to contact with forests is in the scattered groves of the Altai canyons.

In addition to *Populus pilosa* and two species of *Salix*, which were the only trees seen by the writer in the Gobi region proper, an arborescent species of *Betula* was seen by Charles P. Berkey in a large canyon on Ikhe Bogdo. It is significant to note that all three of these genera, as well as *Ulmus* of the grasslands and Gobi border of the south, have wind-borne seeds, a fact which is probably responsible in large part for their

distribution in the more suitable areas of the arid plateau of Mongolia. The source of the seeds which first established the trees of the Altai canyons may be supposed to be the higher and moister continuation of the range to the west. An alternative explanation may be that these patches of trees represent relict areas of a forest which was once more widespread and probably continuous with that farther west along the Altai Mountains. The finding by Nels C. Nelson of birch-bark utensils in a prehistoric burial north of Ikhe Bogdo is evidence, in any case, of the presence of *Betula* in the region for several hundred years.

No data are available as to the age of the trees of *Populus pilosa*, but in view of their probable slow growth it may be supposed to reach several scores of years in the case of the larger individuals. Bearing on this problem is the situation of several of the trees near the head of the fan at Tiger Canyon. The basal 8 or 10 feet of their trunks has been buried by gravel deposits, which may be interpreted as indicating a fluctuation of rainfall and therefore of deposition during the period in which they have been living.