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THE
SILVA OF CHINA

A DESCRIPTION OF THE TREES WHICH GROW
NATURALLY IN CHINA

BY

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OF BIOLOGY

VOLUME II

BETULACEAE—CORYLACEAE

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TO

Professor Woon-Young Chun

Director of Botanical Institute

National Sun Yatsen University

For more than twenty five years Colleague and co-pioneer
in Botanical Exploration and Research

This Volume of the Silva of China

is affectionately dedicated.

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SILVA OF CHINA

BETULACEAE

Trees or shrubs with perulate buds. Leaves alternate, with prominent pinnate lateral veins, mostly serrate; stipules free, often deciduous. Flowers monoecious; staminate inflorescence a pendulous ament, often precocious, terminal or lateral; pistillate flowers in a cylindrical cone-like spike with imbricate bracts, 2-3 to each bract; staminate flower: bracteoles 2-5 within each scale; calyx membranaceous, usually 4-parted, slightly imbricate, stamens 2 or 4; filaments very short; anthers 2-celled, cells connate or separate, opening longitudinally; rudimentary ovary absent; pistillate flower: perianth absent; ovary naked, compressed, 2-celled; styles 2, free, cylindric; ovule solitary and attached near the apex of each cell. Fruiting aments cylindrical or ovoid, bracts deciduous or persistent; nutlets small, winged or wingless, often crowned with persistent styles; seed solitary, pendulous, without endosperm, with straight embryo and flat cotyledons.

KEY TO GENERA

- A. Bracts of fruiting aments thin, 3-lobed, deciduous; stamens 2, bifid.....*Betula*
- AA. Bracts of fruiting aments woody, 5-lobed, persistent; stamens 4, bifid.....*Alnus*

BETULA L.

Deciduous trees or shrubs; buds with several imbricate scales. Leaves petiolate, generally ovate, serrate or dentate to lobulate, with few or many veins. Flowers monoecious. Staminate aments elongated, formed in autumn and remaining naked during winter, every bract with 3 flowers, each flower with a minute 4-parted calyx and 2 stamens bifid at the apex. Pistillate aments oblong or cylindrical, each bract with 3 flowers without calyx. Fruit a minute nut usually with membranaceous wings, at maturity dropping together with the 3-pointed bract from the slender rachis.

About 40 species in the northern hemisphere, in Asia south to Yunnan, Kwangtung and to Himalayas; 16 recorded in China.

KEY TO SPECIES

- A. Fruiting aments 2-4 in a raceme or solitary, pendulous, long and narrowly cylindrical; lateral lobes of bract strongly reduced or distinct, samara with broad wings, exceeding the nutlets nearly 3 times. Leaves many-veined... Sect. 1. ACUMINATAE
 - B. Fruiting aments racemose.....1. *B. alnoides*
 - BB. Fruiting aments solitary.
 - C. Leaves broadly deltoid-ovate or ovate-elliptic, usually more than 6 cm. long; fruiting aments 3.5-11 cm. long.....2. *B. luminifera*
 - CC. Leaves oblong to ovate-oblong, 5-6 cm. long; fruiting aments 3-7 cm. long.....3. *B. Baumeieri*
- AA. Fruiting aments solitary rarely 2, pendulous, spreading to erect; lateral lobes of bracts distinct; samara with wings scarcely broader than the nutlets, usually very narrow. Leaves few-veined.

- B. Fruiting aments erect, usually subglobose, ovate to narrowly elliptic (in *B. Schmidti* cyindric); lateral lobes of bracts nearly always erect to erect-spreading, more or less shorter than the midlobe. Leaves with 6-14 pairs of lateral veins.Sect. 2. COSTATAE
- C. Samara with quite distinct wings, $1/2$ rarely $2/3$ times narrower than the nutlet; fruiting aments ovate-cylindrical to subcylindrical, 2-3 times longer than broad, peduncle quite distinct and slender.Subsect. ERMANIANAE
- D. Flowering and fruiting branchlets more or less abundantly glandulose and villose. Leaves quite thick, midrib prominent beneath, sericeous to bearded-villose; petioles sericeous-villose; fruiting aments elliptic to shortly cylindrical.4. *B. utilis*
- DD. Flowering and fruiting branchlets glabrous (in var. *septrionalis* distinctly glandulose). Leaves thinner, midrib and lateral veins slightly prominent beneath, sparsely sericeous to subglabrous; petioles glabrous to sparsely sericeous; fruiting aments quite cylindrical.5. *B. albo-sinensis*
- CC. Samara with narrowest wings, 4-5 times narrower than the nutlet; peduncle very short and thick; leaves triangular, broadest at base.
- D. Large leaves 6-14 cm. long to ovate-rounded; petioles usually more than 1 cm. long. Tall trees.
- E. Fruiting aments cylindrical, 2-3 cm. long and 8 mm. broad; peduncle quite slender; leaves very shortly and unequally denticulate.Subsect. ASPERAE
6. *B. Schmidti*
- EE. Fruiting aments thickly ovate-elliptic to subglobose, subsessile or with short and thick peduncles; leaves with distinct more or less acuminate teeth.Subsect. GROSSAE
- F. Leaves narrowly ovate, long caudate at apex; samara with distinct wings, $1/2$ to $2/3$ narrower than the nutlet.7. *B. costata*
- FF. Leaves ovate to ovate-elliptic, usually more or less acuminate at apex; samara with narrowest wings.8. *B. insignis*
- DD. Leaves at maximum 6 cm. long; petioles 4-8 cm. long.
- E. Large tree.9. *B. Fargesii*
- EE. Small tree or shrubs.Subsect. CHINENSES
- F. Leaves ovate-oblong, ovate-elliptic or obovate, lateral veins 10-22; petioles scarcely more than 6 mm. long.
- G. Leaves usually with 14-22 pairs of lateral veins white- and red-sericeous beneath; lateral lobes of bracts quite obtuse, suberect.10. *B. Polanini*
- GG. Leaves usually with 10-14 pairs of lateral veins; lateral lobes of bracts acute and divergent.
- H. Leaves sparsely sericeous or glabrous above, more or less loosely white-sericeous beneath, ovate to obovate.11. *B. Delavayi*
- HH. Leaves densely sericeous or glabrous above, densely sericeous along the midrib and lateral veins beneath, broadly ovate or broadly obovate.

- I. Branchlets and fruiting bracts sericeous-villose; small tree or shrubby.....12. *B. Forrestii*
- II. Branchlets and fruiting bracts densely sericeous-villose; a shrub....12a. *B. Forrestii*, var. *calcecola*
- FF. Leaves ovate to ovate-rounded, lateral veins of large leaves 6-10; petioles 6-12 mm. long.....13. *B. chinensis*
- BB. Fruiting aments pendulous or suberect, cylindrical to subelliptic; lateral lobes of bracts suberect to spreading, sometimes slightly recurving, shorter than the mid-lobe. Leaves with 4-8 pairs of lateral veins.....Sect. 3. EXCELSAE
- C. Leaves ovate to ovate-oblong. Fruiting aments suberect, elliptic to sub-cylindrical; samara with wings 1/2 narrower than the nutlet rarely subequal.....Subsect. DAHURICAE
- 14. *B. davurica*
- CC. Leaves triangular to ovate- to rhombic-triangular. Fruiting aments pendulous to subpendulous; samara with wings as broad as the nutlet or twice as broader.....Subsect. ALBAE
- D. Leaves ovate or triangular-ovate.
- E. Leaves glabrous on both surfaces, ovate or triangular-ovate, truncate to broadly cuneate at base...15a. *B. platyphylla*, var. *mandshurica*
- EE. Leaves puberulent or glabrous usually bearded in the axils of veins beneath, triangular-ovate to broadly ovate, truncate or subcordate at base.....15b. *B. platyphylla*, var. *japonica*
- DD. Leaves rhombic-ovate.
- E. Leaves ovate to rhombic-ovate, unequally dentate-serrate along the margins.....15c. *B. platyphylla*, var. *szechuanica*
- EE. Leaves rhombic-ovate, doubly serrate sometimes lobulate along the margins.....15d. *P. platyphylla*, var. *Rockii*

中國森林樹木圖誌

樺木科

喬木或灌木，芽具鱗片。葉互生，具隆起之羽狀側脈，緣大多被鋸齒；托葉不連，常脫落。大小蕊花同株；小蕊花序成下垂柔荑花序，常在放葉前開，頂生或側生；大蕊花成一圓筒狀球果形總狀花序，具覆瓦狀苞片，每苞片生二至三花；小蕊花，在每一鱗片內生二至五枚小苞片；萼膜質，四裂，略作覆瓦狀，小蕊二或四本；花絲極短；藥二室，室連合或分開，縱開；退化子房缺如，大蕊花無花被，子房裸露，扁平，二室；花柱二本，不連，圓筒狀；胚珠獨生，連接於室之頂端處。柔荑果序圓筒狀或卵形，果苞脫落或不落；小堅果小，翅有或無，頂端常冠以不落之花柱；種子獨生，倒生，無胚乳，具直伸之胚與平伏之子葉。

屬之檢索表

- A. 果苞薄，三裂，脫落；小蕊二本，二裂.....*Betula* 樺木屬
 AA. 果苞木質，五裂，不落；小蕊四本，二裂.....*Alnus* 櫟屬

樺木屬

落葉喬木或灌木；芽具數枚覆瓦狀鱗片。葉具柄，大多卵形，緣被鋸齒或齒牙乃至小裂片，脈少數或多數。大小蕊花同株，小蕊花柔荑花序狹長，在秋季已形成，冬季裸露，每一苞片生花三，花具一四裂之小萼與頂端二裂之小蕊二本。大蕊花柔荑花序圓筒狀或圓筒狀，每一苞片生花三，無萼。小堅果通常具膜質之翅，成熟時與三裂之果苞一同自細瘦之軸脫落。

本屬約有四十種生長於北半球，在亞洲，南至雲南，廣東以至喜馬拉耶區域；我國產十六種。

種之檢索表

- A. 柔荑果序二至四枝成一總狀花序或獨生，下垂，長而狹圓筒狀；果苞之側裂片極縮減或明顯，翅果具闊翅，較小堅果寬幾三倍，葉具多數脈.....Sect. 1. ACUMINATAE
 B. 柔荑果序總狀.....1. *B. alnoides* 西樺
 BB. 柔荑果序獨生
 C. 葉闊三角卵形或卵圓形，通常長逾六公分；柔荑果序長三，五至十一公分.....2. *B. luminifera* 亮葉樺
 CC. 葉矩圓形乃至卵矩圓形，長五至六公分；柔荑果序長三至七公分.....3. *B. Baccumkerti* 大翅樺
 AA. 柔荑果序獨生，稀二枝，下垂，開張乃至直立；果苞之側裂片明顯，翅果之翅鮮有關於小堅果者，通常極狹，葉具少數脈。

- B. 柔荑果序直立，通常幾球形，卵形乃至狹橢圓形（遼東樺成圓筒狀）；果苞側裂片幾常直立乃至直立開張，多少較中裂片短。葉具側脈六至十四對。.....Sect. 2. COSTATAE
- C. 翅果具明顯之翅較小堅果狹一半，稀三分之二；柔荑果序卵圓筒狀乃至幾圓筒狀長較闊二至三倍，序柄十分明顯而細瘦。.....Subsect. ERMANIANAE
- D. 花與果之小枝多少具腺體而被長柔毛。葉殊厚，中脈在葉下面隆起，被絲狀毛乃至鬚狀長柔毛；葉柄被絲狀長柔毛；柔荑果序橢圓形乃至短圓筒狀。.....4. *B. utilis* 糙皮樺
- DD. 花與果之小枝不被毛（毛樺具明顯腺體），葉較薄，中脈與側脈在葉下面略隆起，被稀疏絲狀毛乃至幾無毛；葉柄無毛乃至被稀疏絲狀毛；柔荑果序全然圓筒狀。.....5. *B. albo-sinensis* 紅樺
- CC. 翅果具最狹之翅，較小堅果狹四至五倍；序柄極短而粗；葉三角形，基部最闊。
- D. 大葉長六至十四公分，卵圓形；葉柄通常長逾一公分。高喬木。
- E. 柔荑果序圓筒狀，長二至三分，闊八公厘，序柄殊細瘦；葉緣被極短不等之細鋸齒。.....Subsect. ASPERAE
6. *B. Schmidtii* 遼東樺
- EE. 柔荑果序厚，卵圓形乃至幾球形，序柄幾無或短而粗；葉被顯明多少漸尖之齒。.....Subsect. GROSSAE
- F. 葉狹卵形，頂端長尾狀；翅果具明顯之翅較小堅果狹一半乃至三分之二。.....7. *B. costata* 嶺樺
- FF. 葉卵形乃至卵橢圓形，頂端通常多少漸尖；翅果具極狹之翅。.....8. *B. insignis* 香樺
- DD. 最大之葉長六公分；葉柄長四至八公分
- E. 大喬木。.....9. *B. Fargesii* 華北氏樺
- EE. 小喬木或灌木。.....Subsect. CHINENSES
- F. 葉卵矩圓形，卵橢圓形或倒卵形，側脈十至二十二對；葉柄通常長逾六公厘。
- G. 葉通常具側脈十四至二十二對，葉下面被白色及紅色絲狀毛；果苞之側裂片殊鈍，幾直立。.....10. *B. Polanini* 矮樺
- GG. 葉通常具側脈十至十四對；果苞側裂片急尖分叉。
- H. 葉上面被疎散絲狀毛或無毛，下面多少被稀疏白色絲狀毛，卵形乃至倒卵形。.....11. *B. Delavayi* 高山樺
- HH. 葉上面密被絲狀毛或無毛，下面沿中脈與側脈處密被絲狀毛，闊卵形或闊倒卵形。

- I. 小枝與果苞被絲狀長柔毛; 小喬木或灌木狀 12. *B. Forrestii* 濱樺
- II. 小枝與果苞密被絲狀長柔毛; 灌木 12a. *B. Forrestii*, var. *calicula* 崖樺
- FF. 葉卵形乃至卵圓形, 具側脈六至十對; 葉柄長六至十二公厘 13. *B. chinensis* 堅樺
- BB. 柔荑果序下垂或幾直立, 圓筒狀乃至幾橢圓形; 果苞側裂片幾直立乃至開張, 有時略彎, 較中裂片短. 葉具側脈四至八對 Sect. 3. EXCELSAE
- C. 葉卵形乃至卵矩圓形. 柔荑果序幾直立, 橢圓形乃至幾圓筒狀; 翅果之翅較小堅果狹一半稀與小堅果幾等闊 Subsect. DAHURICAE
14. *B. davurica* 棘皮樺
- CC. 葉三角形乃至卵三角形乃至菱形三角形. 柔荑果序下垂乃至幾下垂; 翅果具與小堅果等闊或二倍闊之翅 Subsect. ALBAE
- D. 葉卵形或三角卵形.
- E. 葉上下兩面俱無毛, 卵形乃至三角卵形, 基部截形乃至闊楔形 15a. *B. platyphylla*, var. *mandshurica* 滿洲樺
- EE. 葉下面被細柔毛或不被毛, 通常在脈腋間被鬚狀毛, 三角卵形乃至闊卵形, 基部截形乃至幾心臟形 15b. *B. platyphylla*, var. *japonica* 日本樺
- DD. 葉菱形卵形
- E. 葉卵形乃至菱形卵形, 葉緣通常被齒牙狀鋸齒 15c. *B. platyphylla*, var. *szechuanica* 川樺
- EE. 葉菱形卵形, 葉緣被重鋸齒有時具小裂片 15d. *B. platyphylla*, var. *Rockii* 羅氏樺

BETULA ALNOIDES

1. *Betula alnoides* Hamilton apud D. Don, Prodr. Fl. Nepal. 58 (1825); Hooker f., Fl. Brit. Ind. **5**: 599 (pro parte) (1888); Burkill in Journ. Linn. Soc. **26**: 497 (excl. specim. *Fargesii* et var.) (1899); Gamble, Man. Indian Timb. ed. 2. 669 (1902); Brandis, Ind. Trees 622 (pro parte) (1906); Schneider, Ill. Handb. Laubholz. **2**: 882, fig. 552 g, 553 e-f (1912); in Sargent, Pl. Wils. **2**: 467 (1916); W.Y. Chun, Chin. Econ. Trees 78 (1922); Hu in Hu & Chun, Icon. Plan. Sinic. **3**: pl. 101 (1933); Shun-ching Lee, For. Trees of China. 269 (1935); Yung Chen, Ill. Man. Chin. Trees & Shrubs 155 (1937); Rehder, Man. Cult. Trees & Shrubs, ed. 2. 126 (1940).

Betula acuminata Wallich, Icon. Pl. As. Rar. **2**: 7, t. 109 (1831); Regel in Bull. Soc. Nat. Mosc. **38**: 418 (1865); in De Candolle, Prodr. **16**: 178 (1868); Brandis, For. Fl. Brit. Ind. 458, t. 46 (descript. tantum pro parte) (1874); Franchet in Journ. de Bot. **13**: 207 (excl. specim. *Fargesii* et var.) (1899).

Betulaster acuminata Spach in Ann. Sci. Nat. sér. 2. **15**: 199 (1841).

Betula acuminata, var. *glabra*, *pilosa*, *arguta*, *lanceifolia* Regel in Nouv. Mem. Soc. Nat. Mosc. **13**: 129, 130 (Monog. Betulac. 71, 72), t. 6, f. 29-31, t. 13, f. 29 (1861).

Betula cylindrostachys, var. *pilosa* et *subglabra* Regel in De Candolle, Prodr. **16**: 189 (1868).

Betula alnoides, var. *acuminata* Winkler in Engler, Pflanzenr. **19**(IV. 61): 89, f. 22 A-C (1904).

A deciduous tree to 13 m. high; bark reddish-brown; branchlets reddish-purple, drooping, slender, smooth, at first pilose, finally glabrous, usually glandulose, covered with many roundish lenticels. Leaves chartaceous, ovate to ovate-oblong, acuminate at apex, cuneate to sub-rounded at base, irregularly and doubly serrate along the margins, 4-10 cm. long, 2.5-4 cm. broad, glabrous except sparsely pilose along the midrib above, glabrous except bearded in the axils of veins beneath; lateral veins 10-11 pairs, impressed above, elevated beneath, divergent at 66°; petioles about 2 cm. long, tomentellate. Staminate aments cylindrical, 4-5 in a cluster, drooping, to 12 cm. long, 7 mm. thick; bracts oblong, acute, pilose, reddish-brown; stamens many. Pistillate aments shorter. Fruiting aments 5-7 cm. long 5-7 mm. thick; bracts with reduced lateral lobes. Nutlets with broad wings.

This species of birch is found in the Himalayas in India and in Yunnan and Szechuan provinces at altitudes of 1400-1500 m., also in southern Chekiang province.

EXPLANATION OF PLATE I.

1. A fruiting branchlet, showing fruiting aments (natural size). 2. A branchlet with staminate aments (natural size). 3. A nutlet ($\times 12$). 4-5. Back and front views of a fruiting bract ($\times 12$).

西 樺

1. *Betula alnoides* Hamilton apud D. Don, Prodr. Fl. Nepal, 58 (1825).

落葉喬木，高達十三公尺。樹皮紅棕色，小枝紅棕色，下垂，細瘦，光滑，初時被長軟毛，最後無毛，通常具腺體，被多數帶圓形之皮孔。葉皮紙質，卵形乃至卵矩圓形，頂端漸尖，基部楔形乃至幾圓形，緣具不規則雙重鋸齒，長四至十公分，闊二.五至四公分，葉上面除沿中脈被稀疏長軟毛外，餘無毛，下面除在脈腋間被鬚狀毛外，餘無毛；側脈十至十一對，在葉上面下陷，在葉下面隆起，分歧成六十度角；葉柄長約二公分，被細絨毛。小蕊花柔荑花序圓筒狀，四至五成束，下垂，長達十二公分，厚七公分；苞片矩圓形，急尖，被長軟毛，紅棕色；小蕊多數，大蕊花柔荑花序較短，柔荑果序長五至七公分，厚五至七公厘；果苞具不發達側裂片；小堅果具闊翅。

此種樺木產於喜馬拉耶山，在我國生長於雲南、四川，海拔一千四百至一千五百公尺地域；亦見於浙江南部。

第 一 圖 說 明

1. 果枝示其柔荑果序(原大)。 2. 小蕊花柔荑花序之小枝(原大)。 3. 一小堅果(放大十二倍)。
4-5. 果苞之外面與內面(放大十二倍)。

BETULA LUMINIFERA

2. *Betula luminifera* Winkler in Engler, Pflanzenr. **19** (IV. 61): 91, fig. 23 a-3 (1904);
 Schneider, Ill. Handb. Laubholz. **2**: 882, fig. 552 d, 553 g-h (1912).
Betula acuminata Franchet in Jour. de Bot. **13**: 207 (1899), quoad. specim. *Fargesii*.
Betula acuminata, var. *pyrifolia* Franchet, l. c. (1899).
Betula alnoides Burkill in Jour. Linn. Soc. **26**: 497 (non Hamilton) (1899), quoad. specim.
Fargesii.
Betula alnoides, var. *pyrifolia* Burkill in Jour. Linn. Soc. **26**: 497 (1899), excl. specim.
Delavayi; Bean, Trees & Shrubs Brit. Isl. **1**: 256 (1914).
Betula cylindrostachys Diels in Bot. Jahrb. **29**: 281 (1900).
Betula cylindrostachys, var. *resinosa* Diels, l. c. 282.
Betula wilsoniana Schneider, Ill. Hand. Laubholz. **2**: 882, fig. 552 a, 553 a-b (1912).
Betula hupehensis Schneider, l. c. 882, fig. 552 b, 553 c-d (1912).

A deciduous tree to 20 m. high; trunk to 80 cm. in diam; bark firm, smooth and dark-colored on young trees, becoming dull yellowish-gray or dull orange-red or dull reddish-brown; branchlets slender, terete, striate, tawny-tomentose, finally glabrescent, purple, covered with scattered rounded white lenticels. Buds ovate-lanceolate, acute, covered with imbricate ciliate scales. Leaves chartaceous, broadly deltoid-ovate, ovate or ovate-elliptic, acuminate at apex, truncate, subcordate or rounded at base, irregularly setose-serrate along the margins, pubescent or glabrous above, densely tomentose, pubescent or glabrescent and bearded in the axils of the veins and resinose-glandulose beneath, 4.5-10 cm. long, 2.5-6 cm. broad; lateral veins 12-14 pairs, straight and slightly arching and leading into teeth at the margins, divergent at 40°-65°; petioles slender or rather stout, 1-2 cm. long, tomentose or glabrous. Staminate aments 2-5 in a cluster, with a common peduncle to 12 mm. long, usually covered with resin, narrowly cylindric, bracts broadly ovate, acute, ciliate along the margins. Fruiting aments solitary with slender peduncle to 2 cm. long, cylindric, to 9 cm. long, 7-10 mm. broad; bracts lanceolate, usually auriculate to denticulate on both sides below the middle, sometimes ciliate. Nutlet compressed, obovate, pubescent, with membranaceous wings 2-3 times as broad, 3 mm. long, with wings to 5 mm. broad.

This tree is widely distributed in Hupeh, Szechuan, Kweichow and Kwangsi provinces, growing on mountains from 500 to 2300 m. in altitude. It does not form pure woods, but is always associated with other trees. Its sapwood is not apparently distinct from the heart wood, light yellow to light reddish brown, weighing 26-32 lb. per cubic foot when air-dried.

EXPLANATION OF PLATE 2.

1. A branchlet with young staminate aments (natural size). 2. A branchlet with fruiting aments (natural size). 3-4. Back and front views of a fruiting bract ($\times 12$). 5. A nutlet ($\times 12$).

亮 葉 樺

2. *Betula luminifera* Winkler in Engler, Pflanzenr. 19 (IV. 61): 91, fig. 23 a-3 (1904).

落葉喬木高達二十公尺；樹幹直徑八十公分，樹皮堅密，光滑，幼時色深，漸成暗黃灰色或暗橙黃紅色或暗棕色而帶紅色；小枝細瘦，圓柱狀，具溝槽，被黃棕色絨毛，最後幾無毛，紫色，被疎散圓形白色皮孔。芽卵披針形，急尖，具覆瓦狀被纖毛之鱗片。葉皮紙質，闊三角卵形，卵形或卵橢圓形，頂端漸尖，基部截形，幾心臟形或圓形，緣被不整齊之刺毛狀鋸齒，葉上面被短柔毛或無毛，下面密被絨毛，短柔毛或幾無毛，具樹脂腺體，脈腋間被鬚狀毛，長四、五至十公分，闊二、五至六公分，側脈十二至十四對，直伸，略彎而達於齒，分枝成四十至四十五度角；葉柄細瘦或殊粗壯，長一至二公分，被絨毛或無毛。小蕊花柔荑花序二至五枝成一束，具長達十二公厘之總序柄，通常被樹脂，狹圓筒狀，苞片闊卵形，急尖，緣被纖毛。柔荑果序獨生，具長達二公分之細瘦序柄，圓筒狀，長達九公分，闊七至十公厘，果苞披針形，通常在中部之下兩邊具耳狀裂片乃至齒牙，有時被細纖毛。小堅果扁平，倒卵形，被短柔毛，具膜質之翅較果寬二至三倍，長三公厘，翅闊達五公厘。

此喬木廣佈於湖北，四川，貴州，廣東諸省，生長於海拔五百至二千三百公尺之山嶺，不成純林，常與他種樹木混生。邊材與心材色澤不分，淡黃色乃至淡棕色而帶紅，每一立方尺乾材重二十六至三十二磅。

第 二 圖 說 明

1. 一小枝示幼時小蕊花柔荑花序(原大)。2. 具柔荑果序之小枝(原大)。3-4. 果苞之外面與內面(放大十二倍)。5. 一小堅果(放大十二倍)。

BETULA BAEUMKERI

3. *Betula Baeumkeri* Winkler in Engler, Pflanzenr. **19** (IV: 61): 92, f. 22 D-F (1904); Schneider, Ill. Handb. Laubholz. **2**: 882, f. 552 c, 553 i-k (1912); in Sargent, Pl. Wils. **2**: 468 (1916); Handel-Mazzetti, Symb. Sinic. **7**: 19 (1929); Yung Chen, Ill. Man. Chin. Trees, & Shrubs 155 (1937).

A deciduous tree; young branchlets densely tomentose with spreading hairs. Leaves obliquely oblong to ovate-oblong, acute to shortly acuminate at apex, obliquely rounded at base, unequally sharply serrate along the margins, upper surface dark green, glabrous except tomentulose along the midrib and reticulate, lower surface light green, resinose-punctate and long pilose along the midrib and lateral veins, 5-6 cm. long, 2.5-3.5 cm. broad; lateral veins 10-11 pairs, elevated beneath, divergent at 45°; petioles densely tomentose, 6-8 mm. long. Fruiting aments solitary, pendulous, 3-4 cm. long, 6-8 mm. diam.; bracts small, mid-lobe spatulate, obtuse, about twice as long as the lateral lobes, ciliate. Nutlets oblong to obovate-oblong, pubescent, with wings 2-3-times as broad.

This tree is found in Yunnan, Sikang, Szechuan and Hupeh provinces.

EXPLANATION OF PLATE 3.

1. A. branchlet with fruiting aments (natural size). 2. Back view of a fruiting bract ($\times 12$).
3. The same, front view ($\times 12$). 4. A nutlet ($\times 12$).

大 翅 樺

3. *Betula Baemkeri* Winkler in Engler, Pflanzenr. **19** (IV. 61): 91, f. 22 D-F (1904).

落葉喬木。幼枝密被絨毛並開張之毛。葉斜短圓形乃至卵短圓形，頂端急尖乃至短漸尖，基部斜圓形。緣具不等銳鋸齒。葉上面暗綠色。除沿中脈與網脈處被細絨毛外，餘無毛。葉下面淡綠色，具樹脂點，沿中脈與側脈處被長軟毛，長五至六公分，闊二.五至三.五公分；側脈十至十一對，在葉下面隆起，分歧成四十五度角；葉柄密被絨毛，長六至八公厘；柔荑果序單生，下垂，長三至四公分，直徑六至八公厘；果苞小，中裂片匙形，鈍端，約兩倍長於截形之側裂片，頂端被纖毛。小堅果短圓形乃至倒卵短圓形，被短柔毛，具比果闊二至三倍之翅。

此喬木產於雲南，西康，四川，湖北諸省。

第 三 圖 說 明

1. 具柔荑果序之小枝 (原大)。 2. 果苞之外面 (放大十二倍)。 3. 果苞之內面 (放大十二倍)。
4. 一小堅果 (放大十二倍)。