

Birch identification – a simplified guide

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Birch family (Betulaceae)

Infructescence longer than 4m, with large leaf-like bracts; fruits nut-like and woody; male flowers 4-15 stamens with no petals – Subfamily Coryloideae: Hazels, Ostryopsis, Hop-hornbeam and Hornbeams.

Infructescence cone-like, 1-4cm comprised of persistent woody or deciduous leathery bracts and small fruits with wings (sometimes small and ridge-like); seed leathery (not woody); male flowers 2-4 stamens with minute petals (perianth) – Subfamily: Betuloideae: Birches and Alders



Hazels: *Corylus* spp.

Large trees or multi-stemmed shrubs. Leaf ovate to rounded with 8 or less pairs of leaf veins, infructescence cluster of several 1cm or more woody nuts surrounded by large bell or tubular leafy bracts. About 15 species found throughout northern temperate zone.

Ostryopsis spp.

Shrubs 3-5m tall. Leaves similar to hazel. Male inflorescence enclosed by buds during winter. Infructescence a cluster of several overlapping nutlets enclosed by tubular leafy bracts. Two species in China.

Hornbeams: *Carpinus* spp.

Trees or 8-25m. Leaves elliptic with 10 or more pairs of veins. Infructescence pendulous clusters of numerous leafy bracts, each containing but not enclosing a single nutlet. Male flowers enclosed in buds over winter. About 50 species in northern hemisphere

Hop-hornbeam: *Ostrya* spp.

Trees to 25m tall. Leaves elliptic-ovate with 10 or more pairs of veins. Fruits a nutlet enclosed completely in leafy bracts (bladder-like). Male flowers visible over winter. About 8 species in northern hemisphere

Alders: *Alnus* spp.

A group of about 25-30 species, primarily across the northern hemisphere but also south into central and southern Americas (to Argentina) and SW Asia. Large trees to small shrubs with entire toothed leaves. Noted for Nitrogen-fixing bacteria (*Frankia alni*) and for generally growing in wet areas, although many species are very drought tolerant.

Distinguished from *Betula* in persistent (1-3 years) woody cones with 5-lobed scales. Many have stalked buds with 2 scales, except the *A. viridis* complex that has stalkless buds and leaves most similar to *Betula*.

Birches, *Betula* spp.

A group of 46 species distributed across the northern hemisphere. Small shrubs to large trees with entire toothed leaves.

Guide to Subgenera

Subgenus Nipponobetula. Trees with bark brown-red, peeling. Fruiting catkins erect. Larger leaves with single coarse leaf teeth and whitish beneath, 1 seed per scale.

Section: Nipponobetula, One species



B. corylifolia

Subgenus Aspera. Trees or shrubs with variable bark but generally grey with prominent lenticels. Fruiting catkins erect. Leaves variable but always distinctly veined with sometimes leathery leaves. Seed wings narrow or reduced to a rim and opaque and joined to styles.

Section: Asperae. Seeds lacking distinct wings, reduced to rim. Trees or shrubs.

Subsection Asperae. 8 species. Catkin persistent and only shedding seed up at break up. Scale lobes all similar size and shape.



B. potaninii

Subsection Chinenses. 3 species. Catkin opening and shedding seed on drying. Scale lobes oblong, central much longer than side lobes



Section Lentae. 7 species. Male catkins large. Female fruits remaining erect at fruiting. Twigs smelling of oil of wintergreen.



Subgenus Acuminatae. Section: Acuminatae. 4 species. Tree with smooth bark with distinct lenticels. Large often shiny leaves with mucronate (nipple-like) teeth. Fruiting catkins pendulous, cylindrical and ripening in summer (except *B. maximowicziana*). Seed wings distinctly wider than bracts (evident in fruit).



B. luminifera

Subgenus Betula. Small shrubs to large trees with characteristic peeling, often white bark. Axillary buds present on fruiting shoots. Leaves with generally long petioles and variable in shape and size, but generally smaller. Seed with thin membranous wings not attached to the styles.

Section: Dahuricae. 3 species. Trees, often multi-stemmed. New bark white, turning dark and shaggy with age. Fruiting catkins erect to in plane with branch, only drooping when dry; not terminal.



B. dahurica

Section: *Costatae*. 4 species. Trees or large shrubs. Bark peeling in large sheets, white to dark brown. Leaves various with usually 8 or more veins. Seed erect to drooping and not terminal. Seed wings narrow than seed.



B. ermanii

Section. *Betula*. 9 species. Large shrubs to trees. Bark peeling but in small strips, sometimes corky and often white. Leaves with long leaf stalk with 8 or less pairs of veins. Seed wings broader than seed. Very widespread and variable species. Often difficult to identify.



B. pendula ssp. *mandshurica*

Section: *Aptercaryon*. 7 species. Shrubs, small or large. Twigs densely short-hairy, sometimes long or glandular. Leaves small with 6 or less pairs of veins. Stipules persistent. Fruiting catkin lobes equal in length. Seed wings narrower than seed. Widespread and very difficult due to variation in plants, similarities between species and frequent hybrids. All grow at high latitudes.



B. glandulosa

Species accounts

Subgenus: *Nipponobetula*

Betula corylifolia. A distinct tree to 17m. Bark red-brown and flaking. Only species having leaves with very coarse teeth (lacking secondary teeth between leaf veins). Male catkins 1-2 terminal, with scales with reflexed at tips. Female catkins erect, 45x20mm, large three-pronged scales with 5mm long seeds with narrow wings. Diploid. Rare and endemic in central Japan. Probably a relict and is a distinct ancestral lineage in *Betula*.

Subgenus: *Aspera*

Smaller trees or shrubs. short shoots with fruiting catkins with smaller leaves than vegetative shoots with no axillary buds. Fruiting catkin erect with bracts of three similar lobes. Fruits with opaque wing joining with styles

Section: *Asperae*.

Seed lacking conspicuous wing (narrow rim).

Subsection *Asperae*. Catkin persistent and only breaking up at maturity

Betula bomiensis. Distinct upright shrub with pendulous branches. Small leathery leaves less about as half as long as broad with 10-12 impressed leaf veins, young shoots sparsely hairy. Female catkins small, erect (45° angle), narrow. Rare, SE Tibet.

Betula calcicola. Upright often weeping shrub to 7m. Leaves similar but broader and generally larger than *bomiensis* with 15 pairs veins. Young shoots conspicuously hairy (felt-like, light-brown). Female catkins erect, narrow. Rare, SW China

Betula chichibuensis. Small tree/shrub to 10m. Distinct matt, flattish non-leathery and softly hairy leaves with 17 pairs of veins. Distinctly erect female catkins from emergence, 10x20mm. Very rare, Japan. Excellent yellow autumn colour

Betula delavayi. Shrub to small tree. Leaves larger (to 70mm), variable in shape and distinctly leathery, sometimes indented, less than 8-12 pairs veins and conspicuous glands beneath. Fruiting catking more than 7mm wide, large scales. Rare, W China.

Betula potaninii. Sprawling shrub. Shoots more or less hairless. Leaves elliptic, 17-22 pairs veins, leathery. Fruiting catkins narrow.

Betula schmidtii. Tree to 35m. Unique in *Asperae* with thin and delicate matt leaves with 9-10 pairs veins, broad to long and covered in small glands. Fruiting catkin hairless and not woody and persistent. E Asia.

Subsection *Chinenses*. Catkin opening and shedding seed on drying. Scale lobes oblong, central much longer than side lobes

Betula chinensis. Spreading shrubs to 5m. Fruiting catkin generally rounded, less than 25mm long. Scale more than 3x longer than side lobes. Leaves kite-shaped with 7-9 pairs of veins. E Asia. Rare in cultivation, and of two forms difficult to distinguish.

Betula fargesii. Spreading shrub to spreading tree to 15m. Leaves elliptic matt and somewhat embossed with 8 -10 pairs leaf veins. Fruiting catkin over 25mm long, with scales falling after 4-6 months. Middle scale lobe shorter than chinensis. Seeds three per catkin scale. W China. Rare.

Betula globispica. Tree to 15-20m and often rounded. Leaves shorter and more triangular than fargesii with 8-10 pairs leaf veins. Fruiting catkins persistent for at least one year, glabrous. Middle scale lobe shorter than chinensis. One seed per catkin scale. Rare, Japan.

Section: *Lentae*. Male catkins large. Female fruits remaining erect at fruiting. Twigs smelling of oil of wintergreen. Many are also noted for excellent yellow autumn colour.

Betula lenta. Tree to 20m. Bark often dark, shiny, no peeling and with prominent small lenticels. Buds conical. Twigs thin. Leaves and twigs soon hairless. Leaves elliptic with numerous fine, smallish even sized teeth and 12-18 pairs veins. Fruiting catkin scale lobes relatively equal. E N America. Also forma uber which has rounded leaves

Betula alleghaniensis. Tree to 30m. Bark metallic and yellowish with peeling bark, becoming dark with age. Twigs covered in short hairs. Leaves 12-18 pairs veins, base truncate, tip ending in fine point, hairy underneath. Generally larger in most parts than lenta including female catkins and leaves. E N America.

Betula murrayana. Shrub to 15m. Effectively a shrubby form of alleghaniensis, similar in many details except size, less leaf veins, more rounded leaves and bark that does not peel. Formed from a hybrid between alleghaniensis and pumila. E N America, rare.

Betula grossa. Tree to 25m. Bark grey, not peeling, lenticels visible but not prominent. Leaves with coarse toothing, heart-shaped leaf base, and silky hairs on leaf stalk and some leaves. Female catkins upright, medium sized. Fruiting catkin scale lobes relatively equal. Japan.

Betula insignis. Tree to 25m with often shiny grey bark. Leaves largest in section, broadly spear-shaped (Similar to cylindrostachya that has veins always reaching edges of leaves). Flowering catkins elongating to one of longest in *Betula*. Fruiting catkin scale lateral lobes much shorter than terminal. Two subspecies, insignis (central and western China) and vietnamensis (SE China, Vietnam), distinguished by young leaves in vietnamensis always purple and bumpy immature male catkins.

Betula medwediewii. Spreading shrub to 5m. Bark metallic grey bark with lenticels obvious. Twigs thick and yellow-green, shiny and hairless. Leaves rounded and relatively large. Late to flower. Larger in many parts than megrellica, including leaves and male catkins. Caucasus. These two species are easily confused.

Betula megrellica. Spreading shrub to 4m. Bark metallic grey bark with lenticels obvious. Twigs thick and greyish, matt. Leaves elliptic and somewhat smaller. to flower. Smaller in many parts than medwediewii, including leaves and male catkins. Caucasus. These two species are easily confused.

Subgenus: Acuminata

Trees with smooth bark with distinct lenticels. Large often shiny leaves with long acuminate (or mucronate, nipple-like) teeth with 9 or more pairs of veins. Fruiting catkins pendulous, cylindrical and ripening in summer (except *B. maximowicziana*). Seed wings distinctly wider than bracts (evident in fruit).

Betula alnoides. Tree to 30m. Similar to *cylindrostachya* but young shoots with glands, less toothed on leaves and flowering in autumn. Not in cultivation in Britain as is sub-tropical to tropical.

Betula cylindrostachya. Tree to 30m. Leaves spear-shaped with short petiole. Distinctly purple in new flush of growth. Fruiting catkins in groups of 2-5 or more, rarely solitary with broad lateral bracts .

Betula luminifera. Tree to 25m. Leaves spear-shaped with short petiole. Fruiting catkins mostly solitary, with minute lateral lobes of bracts.

Betula maximowicziana. Tree to 30m. Distinct for its leaves that are broad with heart-shaped bases. Leaf stalk more than 25mm. Broad winter male catkins. Fruiting catkins ripening in autumn. Japan.

Subgenus: Betula

Section: Dahuricae. Trees, often multi-stemmed. New bark white, turning dark and shaggy with age. Fruiting catkins erect to in plane with branch, only drooping when dry; not terminal.

Betula dahurica. Tree to 20m with distinct shaggy bark. Similar to many other birches but distinguished in late fruiting, leaves diamond-shaped and with few teeth (less than 8 pairs). 3 varieties, easily confused.

Betula nigra. Tree to 25m. Distinct peeling or shaggy bark, pink at first then darker with age. Leaves tapering to the base (cuneate), bluish underneath and diamond shaped. Twigs thin, yellow-brown and very small buds.

Betula raddeana. Tree or smaller shrub to 20m. Leaves evenly toothed, elliptic and broadest at middle. Fruiting catkins semi-upright, ripen in late summer and have distinctive widely spreading scales. Similar to many other plants, especially *pubescens* and *dahurica*.

Section: Costatae. Trees or large shrubs. Bark peeling in large sheets, white to dark brown. Leaves various with usually 8 or more veins. Seed erect to drooping and not terminal. Seed wings narrow than seed.

Betula ashburneri. Shrubby tree to 10m of scrappy habit. Stipules persistent. Leaves glossy, leathery with 6-10 pairs veins, with small even teeth. Leaf axils with flattened ribbon-like hairs. Fruiting catkins semi-erect and scales distinctly curved back at maturity with large middle scale lobe. A species similar to *utilis*.

Betula costata. Tree to 30m with fine delicate habit. Bark white and peeling. Twigs thin with numerous veins and sharply but evenly sized teeth. Fruiting catkins erect, small. Fruit with narrow wings

Betula ermanii. Spreading tree to 20m. Bark creamy-white, often with distinct lenticels. Leaves trinagular with 7-12 pairs veins, sharply and coarsely toothed. Fruiting catkin more or less erect.

Betula utilis. A hugely variable species from smaller shrubby to large single-stemmed tree. Bark peeling and varies white (ssp. *jacquemontii*) to red (ssp. *albosinensis* and ssp. *utilis*) to almost black (ssp. *utilis*). Leaves very variable. Distinguished by 'knobbly' male catkins and pendulous fruiting catkins. Four subspecies: *jacquemontii* (white bark, twigs scarcely warty), *utilis* (shiny leathery leaves with impressed veins, bark variable), *occidentalis* (resinous leaves, twigs and buds, smaller deeply toothed leaves) and *albosinensis* (matt flat and thin leaves, red bark).

Section. *Betula*. Large shrubs to trees. Bark peeling but in small strips, sometimes corky and often white. Leaves with long leaf stalk with 8 or less pairs of veins. Seed wings broader than seed. Very widespread and variable species. Often difficult to identify.

Betula celtiberica. Tree to 35m. White trunk to base. Twigs hairy. Leaves with axillary tufts of hairs in the veins. Very similar to *pendula*.

Betula cordifolia. Very similar in all aspects to *papyrifera*. Distinguished by leaves with heart-shaped leaf bases, large lenticels on the stout twigs and large buds.

Betula microphylla. Small tree with multiple stems. Bark greyish white. Leaves rhombic tapering to base. Fruiting catkins more or less erect.

Betula papyrifera. Tree to 30m with often white but also to dark brown. Young twigs often densely hairy with sticky buds. Leaves variable in shape with 6-9 pairs of veins. Seed with broad wings. Exceptionally variable lowland tree.

Betula occidentalis. Upright multistemmed shrub to 10m with dark bark. Twigs sticky. Leaves sea-green, with 2-5 pairs veins and variable in shape. Very poor in cultivation. Hybrid with *papyrifera* (x *utahensis*) grows well and is more a tree.

Betula pendula. Hugely variable tree to 35m. Trunks almost always with corky base, white above. Twigs often weeping, soon losing hairs. Leaves hairless below. Seed twice as long as broad. Distinguished from *populifolia* by lacking long tapering point of leaves and having fruiting catkins that are coarser and easily break up at maturity. Three subspecies: *szechuanica* (large leaves with trunk remaining white to base), *pendula* (corky bark, larger fruiting catkins), and *mandshurica* (less leaf veins, scrappy appearance).

Betula populifolia. Smallish tree. White trunk to base. Distinguished with leaves terminating in a fine tapering point and fruits narrow and slow to break up.

Betula pubescens. A hugely variable species and difficult, especially at high latitude when similar to Section *Apterocaryon*. Distinguished from these by non-persistent stipules and leaves lower on long shoots larger than at apex. Leaf longer than broad with triangular teeth. Seed (without wings) more than 2mm in size.

Betula tianshanica. Tree to 12m with yellowish bark. Twig densely hairy and resinous. A complicated and not well known species from central Asia

Section: *Apterocaryon*. A very difficult group of species, commonly confused. All are dwarf tundra species with grey bark. Shrubs with densely minutely hairy hairs with some with longer hairs. Leaves all small with 6 or less pairs of leaf veins and persistent stipules (except *glandulosa*). Fruiting catkins erect. Fruiting catkin scale more or less equal in length. Seed wings narrower than seed.

Betula glandulosa. Shrub to 3m and often smaller. Shoots distinctly resinous warty with very long fine hairs. Conspicuous petiole to 5mm. Leaves variable in size but always broader than long with rounded teeth. Male catkins terminal and often solitary. Fruiting scales longer than broad. 3 seed per scale.

Betula michauxii. Up to 1m in height with erect stems. Leaf about as broad as long with rounded teeth. Persistent stipules. Fruiting scale with *no lateral lobes*, one seed per scale. An unusual species confined to eastern N America.

Betula nana. Low-growing to 1m in arctic tundra. Twigs hairy with few glands. Leaf circular (broader than long) with few narrowly rounded teeth. Male catkins mostly lower on shoot. Fruiting scales longer than broad. 3 seed per scale.

Betula gmelinii. Twigs stout and densely covered in white glandular warts, especially in second year shoots. Buds sharply (acutely) pointed. Leaf longer than broad, kite-shaped to broadly rounded with serrate teeth. Fruiting catkins robust more than 5mm across with large scales. Seed (without wings) more than 2mm in size.

Betula humilis. Shrub to 2m. Shoots thin and delicate covered in translucent glands. Leaf longer than broad triangular teeth. Fruiting catkins narrow (less than 4mm wide) and crowded on short shoots at tips of branches. Seed (without wings) more than 2mm in size and scales wide (3mm or wider).

Betula pumila. Twigs stout. Leaf longer than broad. Seed (without wings) more than 2mm in size. Most similar to *fruticosa* but originates from N America. Leaves round to almost kidney shaped with broadly rounded teeth and with male catkins mostly low down on shoot.

Betula fruticosa. Twigs stout and variably glandular and hairy. Leaf longer than broad with triangular teeth. Seed (without wings) more than 2mm in size. Most similar to *pumila*, but originates from NE Asia, leaves broadly elliptic with acute teeth and with primarily terminal male catkins.

