Betula cordifolia Regel

Mountain paper birch

Also known as: Mountain white birch, eastern paper birch.

Catkins at blooming stage—female (left), males (right) both extended and pendant

Habitat

Mountain paper birch occurs on a wide range of moist, moderately drained soils, typically, but not exclusively, at higher elevations and on north-facing slopes. In southern New Brunswick, mountain paper birch is prominent close to the shores of the Bay of Fundy. It grows in mixture with a large number of other species but, as it is shade intolerant, it occupies positions in the upper canopy.

Form

Mountain paper birch grows to heights of up to 25 m and to stem diameters of up to 70 cm. The crown is broadly oval with its lower main branches tending to be more horizontal than upwardly inclined.

Fruiting catkin of the previous year, partially broken up

Morphology

The **leaves** are deciduous, simple, and arranged alternately along the long shoots and, although alternate, appear as pairs on most short shoots. Each leaf is 6–12 cm long, ovate, with a short tapered point, usually a cordate (roundly indented) base, and a doubly toothed margin. Upper surfaces of the leaves are dull green and dotted with tiny resin glands between the mostly straight, six to nine secondary veins per side; lower surfaces are paler. Leaves towards the ends of long shoots are neoformed and may have somewhat different characteristics from the preformed leaves at the bases of long shoots and on all short shoots.

Twigs are of two kinds, long and short. The **long twigs** (long shoots) become yellowish brown to dark brown by fall and are dotted with pale lenticels and warty resin glands. Their buds are all lateral buds (the end bud is a pseudoterminal bud) and each is ovoid, blunt pointed, brown, and has three visible overlapping bud scales. The **short shoots** extend only about a millimeter, usually bear two

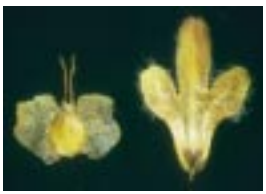
leaves (and later, their leaf scars) and an ovoid terminal bud that has five to seven overlapping bud scales. Each short shoot commonly produces another short shoot, so on older branch segments, axes consisting of several successive short shoots are frequent.

Flowers are borne in catkins of two kinds. **Male catkins** are preformed before winter as elongated structures, 2–4 cm long, borne in outwardly spreading groups of two to four at the ends of long shoots. In the spring, as the new leaves begin to expand, the male catkins extend to lengths of up to 10 cm and hang limply. This spreads out their flowers, which then shed pollen into the air; subsequently the male catkins fall from the tree. **Female catkins** are also preformed but remain tiny over winter inside the terminal buds of short shoots, so are not visible until they extend in the spring. This extension, to 15–40 mm, occurs beyond the two expanding short-shoot leaves. The female catkins mostly are pendant during the pollination period. After that, they expand in length (to 3–5 cm) and thickness as their bracts and developing fruits grow (there are usually three fruits in the axil of each bract). The fruiting catkins change from green to brown as they ripen in the autumn, and then the bracts and fruits begin to fall from the catkins' hanging axes. Each flat **bract** is three lobed, the central lobe is longest and parallel sided, the side lobes are directed forwards, and all three are round tipped and hairy fringed. Each **fruit** is a hard, brown, ovoid nutlet, 2–4 mm long, with two flat, pale brown, broadly oval lateral wings and, at its tip, two prominent, hair-like, brown stigmas, 1.5–2 mm long (held over from the flower). Each fruit can contain one **seed**.

Bark of young stem, 5-cm diameter

The **bark** of young trees is shiny, reddish brown, with some wrinkling, and dotted with pale brown horizontal lenticels. Older bark is whitish, usually with a pinkish purple to bronze tinge, and is often somewhat ragged in appearance because small portions peel away readily, around the trunk, into thin sheets, which are copper colored on their inner surfaces. The bark is marked by many long, corky, horizontal lenticels.

Bark of old stem, 27-cm diameter



Fruit (left) and bract (right)

Notes

Mountain paper birch has only recently been fully recognized as a distinct species from white birch (*Betula papyrifera* Marsh.). Previously, the two species were treated as one. Generally, this was a problem because the species are similar ecologically and silviculturally. It is likely that the native peoples knew how to distinguish them because the bark of white birch tends to be shed in single, thick layers (not in multiple thin sheets), and is thus more serviceable for sheathing canoes and for fashioning utensils.

The details in the description should help to distinguish mountain paper birch from white birch (or grey birch [*Betula populifolia* Marsh.], with which it is known to hybridize). The leaves of white birch are more likely to be broadly wedge shaped, rounded, or straight across than cordate at the base; the reverse is true for mountain paper birch. Leaves of white birch and grey birch lack resin dots, and those of grey birch are shiny on their upper surfaces, and are long, taper pointed.

The twigs of white birch tend to be hairy at first, but lose most hair by fall. They have only occasional warty resin glands. Twigs of grey birch are slender and have many warty resin glands. Twigs of mountain paper birch are intermediate with respect to warty resin glands.

In winter, crown features help to distinguish the three species. Branches of white birch tend to have a mostly upward and outward orientation, giving a graceful appearance. Mountain paper birch branches have a flatter orientation. Those of grey birch are also horizontally oriented, but they are thin, and more numerous, and the crowns are relatively narrow. From close up, overwintering male catkins can help in identification. Grey birch has only one or rarely two at its twig tips, white birch usually two or three, and rarely one or four, and mountain paper birch, two, three, or quite often four. Those of grey birch are much smaller than those of the other two species.

The fruiting catkins and their bracts and fruits are also useful means of species identification. The catkins of white and mountain paper birches are similar in length (3–5 cm), but those of the mountain paper birch are somewhat broader and more ragged because the bracts and the tips of the bracts are longer. Fruiting catkins of grey birch are only about 2 cm long and rather neatly compact. Bracts of grey birch are the smallest, while those of mountain paper birch are the largest. The mountain paper birch bracts have long tips with the two side lobes located at the front. The tip of a grey birch bract is short and pointed and its side lobes are outwardly and somewhat downwardly oriented. The bracts of white birch are intermediate between the others with a pointed tip and rounded side lobes of about equal length, the latter only slightly, if at all, forwardly oriented. The fruits of mountain paper birch are the largest and they have the most prominent stigma remnants at their tip.

Mountain paper birch wood is moderately hard, diffuse porous, and white or cream to pale brown; it has a uniform texture. It may be used in wooden ware, especially for turned goods such as dowels and spindles.

Mountain paper birch is sometimes affected by birch dieback which can result in tree death. The cause of birch dieback is thought to be a combination of several factors stressing the tree at one time. Mountain paper birch is susceptible to effects of acid deposition in precipitation; this has been observed in mountain paper birch located within the Fundy fog belt, where often persistent fogs carry considerable loads of acid and other material.