

# Erin D. Sino-Himalayn Guide Walk (Oct.13, 2021)

## *Betula utilis* var. *jacquemontii*

### The plant:

- *Betula utilis* var. *jacquemontii* (Himalayan Birch, West Himalayan Birch, Kashmir Birch, Whitebarked Himalayan Birch) (Family Betulaceae)
- Deciduous tree
- Extremely white paper-like bark with horizontal lenticels (pores in the bark which allow gas exchange), catkins in spring (male and female catkins), drooping cone-like fruits with small winged seeds in fall
- Native to the Western Himalayas (Badakhshan in NE Afghanistan/S. Tajikistan, Pakistan through NW India), growing at elevations up to 4500m
- Frequently grows among conifers with a shrubby undergrowth which usually includes Rhododendrons
- Relies on water from snowmelt rather than monsoon rains
- Does best in cool, northern climates where root zones are covered with snow in the winter
- Does poorly in the heat and in humid areas
- Keep root zones cool and moist
- Full sun/Part shade
- Tolerant of a wide range of soils (clay/sand) but needs constant moisture
- Needs little pruning, but best to prune in the dormant season if need be. Avoid pruning in spring when sap is running.
- Vulnerable to Bronze Birch Borer
- Anti-inflammatory tea can be made using the leaves and bark, good for the respiratory and digestive tracts

### Bronze Birch Borer:

- *Agrilus anxius* (Coleoptera)
- Wood-boring Buprestid beetle (Jewel beetles)
- Native to North America, warmer regions (rare in the North)
- Most resistant: *Betula nigra* (River Birch)
- European and Asian birches have less resistance
- Signs of infestation: thinning crown; off-colour foliage in upper canopy; premature leaf drop; branch dieback in crown; winding galleries between the bark and the wood usually filled with packed, digested sawdust-like borings; raised welts on the bark of branches or trunks; sap flows on the trunk near larval entry holes; D-shaped adult emergence holes on branches and trunk
- Damage progresses from the upper crown and works its way toward the trunk resulting in tree mortality
- Attacks weak or injured trees from drought, poor growing conditions or other infestations

### Life Cycle:

- Generally 2 years in the north (2 winter periods) and 1 year in the south
- Adults emerge early June, visible until August, live for 3 weeks, feed on birch foliage, deposit eggs in crevices, prefer unshaded parts of the tree
- Larvae bore through the bark into the cambium and excavate zigzag galleries which disrupt the flow of sap, starving the plant of water and nutrients
- First winter – immature, overwinter in a gallery constructed deep into the wood, come closer to the surface in spring
- Control/Management: Keep trees healthy and vigorous, or plant more tolerant species

### Birch Bark Manuscripts:

- Writing lengthy texts in Sanskrit and other scripts on the inner layer of birch bark was common before paper was readily available in the 16<sup>th</sup> century under Akbar I, third ruler of the Mughal Empire, particularly in historical Kashmir.

- Kashmiri pandits reported that all of their books were written on Himalayan birch bark until then. This practice was mentioned by early Sanskrit writers: Kalidasa (4<sup>th</sup> C playwright and dramatist), Sushruta (3<sup>rd</sup> C physician and surgeon), and Varahimihira (6<sup>th</sup> C astrologer, astronomer and polymath).
- Texts have been found in Northern India, Pakistan, Afghanistan, Nepal, and China (in Kucha which was on the northern silk road).
- The Sanskrit word for birch is bhurja, sharing a similarity with other Indo-European words that provide the origin for the common name “birch”.
- There is still a practice of writing sacred mantras on birch bark and wearing them for protection or blessing. This practice was mentioned as early as the 8<sup>th</sup> or 9<sup>th</sup> C CE in the Lakshmi Tantra, a Pancharatra text (a religious movement in Hinduism originating in the 3<sup>rd</sup> C BCE).

#### Gandharan Buddhist texts:

- the oldest, written in about the first C CE, found/created in Afghanistan
- written on birch bark and stored in clay jars
- Earliest known versions of significant Buddhist scriptures, including a Dhammapada (a discourse of the Buddha), including the Rhinoceros Sutra, Avadanas, and Abhidharma texts.
- likely the oldest extant Indic texts
- 1994, a similar collection of Gandhari texts from same era were found

The Senior collection: Scrolls 9-5” wide, 12-18” long, overlapping rolls glued together to form longer scrolls. Thread-sewn edges to hold them together, black ink, longest 84” long. Written on both sides, begin at top one side, flip over and turn upside down, so text concluded at the top and back of scroll. Probably represent a fraction of what was a larger set of texts, compiled and preserved in the library of a monastery of the Dharmagupta sect in Nagarahara

#### The Bakhshali manuscript:

- 70 birchbark fragments written in Sanskrit and Prakrit, found in 1881 near Peshawar, Pakistan
- 2<sup>nd</sup>- 3<sup>rd</sup> C CE, oldest extant manuscript in Indian mathematics
- A compilation of mathematical rules and examples and prose commentaries with solutions to the problems, which involve arithmetic, algebra, and geometry
- Include fractions, square roots, arithmetic and geometric progressions, solutions of simple equations, simultaneous linear equations, quadratic equations, and indeterminate equations of the second degree
- Uses numerals with a place-value system, using a dot as a place holder for zero
- Large collection discovered in Afghanistan during the civil war (late 20<sup>th</sup>/early 21<sup>st</sup> C), about 3000 scroll fragments, 2<sup>nd</sup> - 8<sup>th</sup> C CE, Sanskrit or Buddhist Sanskrit
- Bower Manuscript, about 450 CE, found in Kucha (China, an ancient Buddhist Kingdom on the Silk Road), one of the oldest Sanskrit texts on birchbark in Brahmi script
- Gilgit manuscripts, 5<sup>th</sup> -6<sup>th</sup> C AD, Buddhist texts, found in Pakistan, various sutras including the Lotus Sutra
- Manuscript containing Devikava text, from Nepal

#### East Slavic texts:

- Novgorod (1951), one of the oldest cities in Russia (first mentioned 9<sup>th</sup> C CE), birch bark writing dating to c.1400
- Over 1000 documents found in Russia, Novgorod being the most prolific source of them
- Others found in Ukraine and Belarus
- Amazing state of preservation due to heavy clay layer preventing access of oxygen
- Over 200 styluses found, iron, some bone or bronze
- Most are ordinary letters, business or personal, a few elaborate obscenities, some school exercises and drawings by a young boy named Onfim
- More recent letters written on birch bark where paper was not accessible, Soviet forced settlements, GULAG camps

#### Other uses of the tree include:

- Bark – packaging material (for butter), roof construction, umbrella covers, bandages, etc
- Wood – bridge construction, firewood

[https://en.wikipedia.org/wiki/Betula\\_utilis](https://en.wikipedia.org/wiki/Betula_utilis)  
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