Scientific Name: *Chamerion latifolium,* synonym: *Epilobium latifolium*

Common Names: Dwarf Fireweed, River Beauty, Alpine fireweed, Broad-leaved Willowherb

Above*: Chamerion latifolium*. Jason Grant, some rights reserved (CC BY-NC). https://www.inaturalist.org/observations/14157153. Cropped from the original.

Life Form: Forb

Site Preferences: Damp slopes, margins of stream, river gravels and sandy areas. Found in wooded areas of high and low altitude (Matheus & Omtzigt, 2013) (Burton & Burton, 2003)

Tolerances: Tolerant of coarse soils, and mineral soils associated with tailings ponds (Burton & Burton, 2003). Can be very shade tolerant. Tolerant to a wide range of pH (Hardy 1989).

Distribution: Russia, Alaska, Yukon, Northwest Territories, Nunavut, British Columbia, Quebec and Greenland (Burton & Burton, 2003).

Plant Identification: *Chamerion latifolium* is a low growing herb with a woody base. The leaves are fleshy and do not have stalks. They are arranged in an alternate pattern on the stem (Aiken et al., 2007). Leaves may be 25- 45mm in length and 10-15mm in width (Aiken et al., 2007). Each plant may have two or more flowering stems that have short white or translucent hairs. Flowers range from showy pink to rose-purple with four obovate petals and four dark purple sepals (Aiken et al., 2007; Burton & Burton, 2003).

Seeds are grown in dehiscent capsules that turn golden when ripe (Moore & Hunt, 2003). Seeds range from 1.8-2.0mm in length and have tufts of yellowish hairs up to 10mm long (Aitken et al., 2007).

Chamerion latifolium can be differentiated from the closely related *Chamerion angustifolium* by size. *C. angustifolium*, known commonly as fireweed, can grow from 20-100cm in height (Aitken et al, 2007). The mature plant size of *C. latifolium* ranges from 5 – 30cm tall (Aiken et al., 2007; Burton & Burton, 2003).

Above: *C. latifolium* flower. Matt Muir, some rights reserved (CC BY-NC-SA). https://www.inaturalist.org/observations/17489834

Harvesting Considerations:

Seeds are ready to be harvested when capsules begin to show signs of opening. This occurs near the end of July in northern British Columbia (Burton & Burton, 2003). This may vary in Yukon and should be determined by forecasting earlier in the season (Banerjee et al., 2001). It is important to harvest ripe seeds quickly before the capsule opens, as overripe seeds will be carried away by the wind (Burton & Burton, 2003).

If a population is small, sample as randomly as possible. If the population is large and has little phenotypic variation, establish grids or transects to sample individuals. If large variations in environmental conditions exist in the landscape, record these differences and keep seeds from different areas separate (Way, 2003). The number of individuals sampled from the separate areas should be in proportion to the individuals in the subpopulation relative to the total population size (Way, 2003). Ensure that sampling methods do not remove more than 20% of available seeds (Way & Gold, 2014).

Above: Mature capsule of *C. latifolium* beginning to dehisce. Kathy Thornhill. 2005. Flora of the Canadian Arctic Archipelago. https://nature.ca/aaflora/data/www/onepla.htm.

Seed Collection:

Assess ripeness of capsules before collection. Ripe seed capsules may be harvested individually or as entire fruiting stalks by using sharp hand clippers and holding the capsules over a bucket. A bag may be placed over the capsules to prevent seed loss (Burton & Burton, 2003).

Post-Harvest Handling:

Seeds should be stored in cool dry conditions (Burton & Burton, 2003). Ensure seeds do not overheat in direct sunlight or in a parked car. Label all bags inside and out, and inspect collections from different collectors before combining (Way & Gold, 2014).

Seed Processing:

Allow seeds to air dry in a well-ventilated area between 5°C and 20°C with low relative humidity (15% RH recommended). *C. latifolium* seeds likely have orthodox seed behavior and should be dried down to approximately 15% equilibrium relative humidity (eRH) (Royal Botanic Garden Kew, 2018) . eRH is a measure of the relative humidity of seeds at equilibrium with air in a sealed chamber and can be measured with a hygrometer (Linington & Manger, 2014). Seeds should be brushed gently to remove the fluff and not damage the seed.

An alternative method of cleaning is to use a shop vacuum with a cloth attached to the filter (Gordon, 2016). Seeds are collected in the canister while the cloth captures the fluff. Newspaper is then laid on a table with a 2mm window screen place on top. The fluff is spread on the screen and covered by an additional screen. The vacuum is moved along the top screen slowly to separate the seeds still attached to the hairs. Fluff is then discarded. Seeds are then sieved through a 0.25m screen to remove any stalk remaining. Seeds should be placed in labeled, airtight containers for storage.

If a fanning mill is available, the following configurations can be used to clean the seeds. Prescreen 1.2 x 7.1mm slot with a top screen 1.2 x 1.5mm slot and bottom blank. A vacuum separator set to

low suction is then used to remove dust and fluff. Seeds can then be sieved with a 0.6mm hand sieve if necessary (Burton & Burton, 2003).

Seed Storage:

No data is available on the longevity of *C. latifolium* seeds but some resources state that the closely related *C. angustifolium* are rarely viable after 3 years of storage (Aitken et al., 2007). However, the seed behavior of *C. latifolium* is likely orthodox and longevity may be improved by storing seeds frozen (Royal Botanic Gardens Kew, 2018). Longevity of orthodox seeds increases with low moisture content and low temperatures (Rao et al., 2006). Store seeds in freezer at -18 °C ± 3 °C for long-term conservation (FAO, 2014).

Germination Pre-treatment:

No pre-germination treatments are recommended by Burton & Burton (2003) although other resources suggest a cold/moist stratification with ambient temperature changes (Moore & Hunt, 2003).

Seed Germination:

For germination testing, label germination containers with collection number, species, germination conditions, start date, and number of seeds. Place germination paper into petri dishes. Wet paper just enough so that paper is moist but there is no standing water. Place a representative sample of seeds into Petri dish and space in an even grid. Multiple dishes may be required depending on sample size. Place lids on Petri dishes and place in germination chamber (or area with stable temperature) at 22°C (Baskin & Baskin, 2002) (Davies et al., 2015). Seeds should not be in direct sunlight but exposed to daylight. Monitor seeds daily and record proportion of seeds having germinated. Moisten filter paper as necessary. Most seeds will germinate in 10 days (Moore & Hunt, 2003).

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