AQUA-FIRMA
Water Wilderness Wildlife

Plants of Spitsbergen

Unlike the dramatic monochrome of the Antarctic landscape, one of the first things we notice when exploring the high arctic and particularly Spitsbergen is the rich and vibrant swathes of colour bestowed upon the scene by the plant life of the tundra. Plants which live within the High Arctic must be able to withstand the sub-zero climate which characterizes areas such as Spitsbergen for much of the year and then wetland conditions which arise during the summer months when the ice begins to melt.

Svalbard is home to many species of mosses, lichens, grasses, herbs, flowering plants and dwarf shrubs; many of which have developed various adaptations in order to survive in this icy landscape:

- By growing close to the ground and close together, the harsh effects of the cold weather are reduced, reducing the amount of damage sustained by the plant otherwise caused by the effects of ice and snow carried by the winds.
- The plants tend to be small, with shallow roots, maximising the available space in the thin layer of earth that is unfrozen.
- In helping to retain moisture, water is released from the leaf surface.
- Plants in the Arctic are able to grow under a layer of snow and can perform photosynthesis within the Arctic climate.
- Some Arctic plants, such as lichens, can survive on bare rock and saxifrages can become established on very rocky substrate with almost no nutrients available.
- The long hours of sunlight in the summer months are used to produce flowers quickly within this short time period.

Purple saxifrage (*Saxifraga oppositifolia*)

This edible saxifrage is very common throughout the region of the high Arctic and can be found in mountainous habitats in Britain, the Alps and the Rocky Mountains and has been found at latitudes exceeding 83°N. The purple saxifrage is a low-growing, matted plant, which typically reaches a height of 3–5 cm. It has woody branches, which tend to spread out along the ground. With small, rounded leaves, which are scale-like in appearance, the purple saxifrage displays solitary purple – lilac flowers, which are edible and sweet-tasting. It is one of the very first spring flowers, which continues to flower throughout the whole summer in localities where the snow melts later and is a generalist; found in numerous cold-temperate to Arctic habitats, from sea level up to 1000 m.

Yellow mountain saxifrage (*Saxifraga aizoides*)

The yellow mountain saxifrage is typically found in cold and wet cliff environments, usually where shale is present and is commonly encountered across Svalbard, where it is most-often found in the seepage areas of cliffs and waterfall spray zones. Its numerous basal outshoots are typically 3-20 cm long. Growing in a mat of fleshy green stems with multiple, short, fleshy leaves growing from the bottom to the top of the stems, the edges of the leaves of the yellow mountain saxifrage have stiff hairs, scattered in their distribution. The small yellow flowers are arranged in clusters at the tops of the stems and are composed of five, narrow, bright yellow petals alternating with light green, slightly shorter sepals that are overlaid with the bright yellow filaments of the stamens.

Alpine saxifrage (*Saxifraga nivalis*)

The alpine saxifrage is a perennial species, which can be found across a range of habitats across Spitsbergen, from rocky areas to areas of shaded vegetation, often on montane ledges and outcrops, where there is both shelter and a nutrient-rich substratum. However, the alpine saxifrage is not very tolerant of competition from other plant species and as a result, it is often found in small groups in damp crevasses.

Hawkweed-leaved saxifrage (*Saxifraga hieracifolia*)

The hawkweed-leaved saxifrage is a species of saxifrage found throughout the high Arctic and some alpine areas, such as Norway and Alps. Growing to 10–20 cm tall, the hawkweed-leaved saxifrage has leaves which are roughly rectangular in shape, thick and ‘toothed’. The flowers are produced in dense clusters, small and inconspicuous, with greenish to purplish petals. The single prominent stem is thick and vascular.

Moss campion (*Silene acaulis*)

This small montane plant is common throughout the high Arctic and the higher mountains of Europe and North America. It is densely tufted in appearance and forms ‘cushions’ composed of long shoots with four or five small green leaves at their apex and many remnants of old leaves below. The cushion has a very long, solid ‘taproot’ and the leaves are narrow with short stiff marginal hairs. The cushion produces its own warmer micro-climate, trapping heat when the Sun shines. The small pink flowers display "compass flowering", whereby developing flowers appear on one side initially; in this case, the south-facing side of the plant, followed later by the north-facing side. Moss campion grows predominantly in dry, stony habitats but is found also in damp locations.

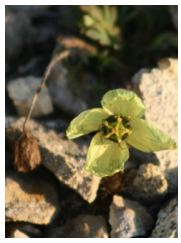
Dwarf birch (*Betula nana*)

The dwarf birch is a species of birch within the family Betulaceae and grows to a height of 1-1.2 m, although this is not seen often within Arctic habitats. The bark is copper-coloured and does not peel and the leaves are rounded, less than 2 cm diameter, with a bluntly serrated margin. Being native to the Arctic and cool climates across Europe, North America and northern Asia, the dwarf birch is found across a broad range of habitats

Polar willow (*Salix polaris*)

This species of willow has a circumpolar distribution within the high Arctic tundra, extending North to the limits of continental landmass and South, to montane habitats in Norway, the northern Ural Mountains and Canada. One of the smallest willows in the world, this small, creeping dwarf shrub (only 2-9 cm high), has underground runners within the soil layers. The leaves are rounded and dark green and have entire margins. The flowers are grouped together in short catkins, with each bearing only a few flowers. By creating separate female and male plants, the polar willow is known as a 'dioecious' plant.

Svalbard poppy (*Papaver dahlianum*)



The Svalbard poppy is the symbolic flower for this Arctic archipelago and is commonly found across a range of rocky and 'gravely' habitats there. It holds the record for being found at the highest altitude on Svalbard higher than any other flowering plants. Both the leaves and flowers are hirsute (hairy), with the flower comprising of four white or yellow petals which are slightly undulated. The Svalbard may reach a height of up to 25 cm.

Mountain sorrel (*Oxyria digyna*)

This common Arctic species can be found across a range of tundra and montane habitats, where it grows in dense tufts, with stems up to 20 cm high. Both flowering stems and leaf stalks have a reddish colouration and the kidney-shaped leaves sit on stalks growing from the basal part of the stem. The flowers are grouped together and are characteristically small and green, later turning red. The leaves have a fresh acidic taste and are rich in vitamin C, containing over 35 mg/100g; which can be used to both prevent and cure scurvy.

Photos by: Chris Dobbs, Ben Garrod, Michael Haferkamp, Kim Hansen, Teun Spaans, Ansgar Walk