

# Petalwort

## *Petalophyllum ralfsii*



Top: Petalwort thalli, Middle: Petalwort sporophytes in the early stages of development, Bottom: Mature Petalwort sporophytes

Petalwort is a small, green liverwort shaped like a small rosette and is often likened to a miniature lettuce. It is one of the more distinctive liverworts but can occasionally be confused with some species of *Fossombronia*. Petalwort consists of a midrib flanked by two flat leaf like wings, on which near-parallel ridges of lamellae radiate from the midrib to the margin, unique amongst British liverworts. Individuals are no more than 15x10mm in size and more typically much less than 10mm.

Petalwort is dioecious and there are some easily identifiable, morphological differences between male and female plants. Towards the centre of male plants there is a cluster of small spherical structures known as antheridia – these are absent on females and in their place is a rosette of erect, tooth-like bracts.

### Lifecycle

Petalwort is a perennial liverwort and grows from early-autumn to late spring. Rainwater, flooding and surface water-flow transfers spermatophytes produced by the male's antheridia to the female plants to enable sexual reproduction.

Female plants produce the sporophytes, starting as small green/light coloured spheres close to the surface of the plant and as they mature, they extend upwards on a stem (seta) and begin to darken to a dark brown or black. The sporophytes are very delicate and the spores are released with little disturbance, the large spores produced travel only short distances.

Petalwort is also capable of reproducing asexually, effectively creating clones through underground branches. Plants begin to die back as the weather turns warmer and drier and only the thick, underground parts of the plant survive.

### Distribution

Petalwort is widespread throughout the Mediterranean including North Africa, Turkey and Portugal. In Britain, it is confined to sandy, coastal areas of dunes and machairs. There are several populations in Cornwall and Wales as well as colonies in the north-west and north-east of England and the far-north of Scotland.



*Petalwort distribution across Britain*

## Habitat

Petalwort colonises bare patches of ground where damp, calcareous sand is present. It favours early-successional dune slacks and can also be found in lightly trampled or well grazed areas which offers a very short sward and incomplete ground cover. It may be found on pathways through dune slacks where occasional flooding takes place. Petalwort cannot colonise areas of loose sand and so incipient dune slacks are unsuitable but will be potential future habitat. Despite its preference for bare ground, individuals can persist where there is complete vegetation cover so long as the sward is kept short.

## Protection

Petalwort is protected in the UK under the Wildlife and Countryside Act 1981 and as a priority species under the UK Biodiversity Action Plan (UK BAP). This plant is included as a species “of principal importance for the purpose of conserving biodiversity” under Section 41 (England) of the Natural Environment and Rural Communities Act 2006.

## Survey method

Surveys for new populations and population counts should be carried out between September and April. Search known populations from April to June for signs of sexual reproduction.

## Reasons for decline

As a slow growing species which colonises early- to mid-successional stage dune slacks, Petalwort is incredibly vulnerable to change.

Rabbits were once farmed for their meat and fur on many sand dune systems as they were often seen as barren areas devoid of life. We know now that this was not the case and in fact rabbits were responsible for maintaining the biodiversity of wildlife in these habitats. Intensive grazing and mass disturbance through the creation of burrows provided the conditions for many dune species to flourish, including Petalwort. However, the outbreak of myxomatosis in the 1950s saw rabbit populations collapse, intensive grazing disappeared and areas soon became overgrown with vegetation.

Around the same time, it became apparent that fewer people were visiting coastal resorts. Before this, holiday makers would descend on British beaches and sand dunes in their tens of thousands every day, causing disturbance for the benefit of dune specialist species, including Petalwort. Unfortunately, cheaper air travel meant holidaying abroad became more accessible and visitor numbers fell.

In more recent times, urban and agricultural expansion, the spread of invasive species such as Sea Buckthorn and Japanese Rose, climate change and increased levels of nitrogen are responsible for the loss of habitat.

## Habitat management

Urgent attention is required to prevent Petalwort going extinct altogether and priority must be given to ensuring current populations of Petalwort decline no further, increasing population size and range where possible. Frequent seasonal mowing and grazing will maintain a short sward and create some disturbance for Petalwort to survive, shallow scrapes no more than 5cm in depth may reactivate dormant spores and encourage new growth. Manage the spread of scrub by digging or ripping out, the disturbance creating some bare ground which may be colonised by Petalwort. New slacks with large draw-down zones will be suitable areas for new populations to colonise.