

Fossombronia

a liverwort that looks more like a *very* small lettuce or a marine nudibranch!

Fossombronia is an unusual liverwort that stands out, bright green, in stark contrast to the conservative sombre greys and khaki greens of the Australian bush. In some ways it's rather like the difference between the rich green leaves of Kurrajong trees (*Brachychiton populneus*) and the blue-grey-green of *Eucalyptus* leaves. Liverworts are closely related to mosses, and together with *hornworts* are classified as *bryophytes*.



Fossombronia – Nangar National Park. Scale bar: millimetres



Fossombronia capsules have translucent stems (*setae*) and spores are produced in black, globular structures at the top.

Photo: R J Oldfield

In general, *bryophytes* are *tiny*, they don't have the internal water and nutrient conducting systems found in ferns, conifers and flowering plants, nor do they have roots, but they do have root-like anchoring structures called *rhizoids* that are usually colourless in liverworts and hornworts and brown in mosses. Moisture and nutrients are absorbed directly from the environment into stems and leaves. They reproduce by *spores*, not by seeds, and the spores are produced in capsules at the top of long stalks (*setae*).

There are two main groups of liverworts: thallose liverworts and leafy liverworts. Leafy liverworts can be confusing as they look very similar to mosses. Their leaves are well developed, but never have a *costa* (that's a structure that is somewhat similar to a *mid-rib*, not a *presenter* in *Gardening Australia*), and they are usually flattened, with three rows of leaves, one down

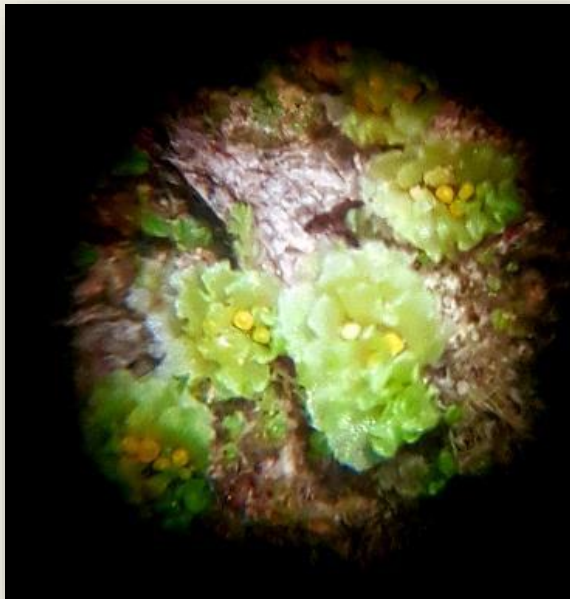


A leafy liverwort
Photo: R J Oldfield



A thallose liverwort

each side of the stem, and a third on the underside of the stem. In contrast, thallose liverworts are a bit like lichens, flattened and leafless. In some species, the *thallus* can be many cells thick, in others just one cell thick. Liverwort capsules are usually globular, dark in colour and unlike mosses, split open to release their spores almost instantaneously. The capsule stalks (*setae*) are colourless, (translucent) fragile and short-lived.



Yellow sperm-containing antheridia form within the axils of the 'leaves' of *Fossombronia*.

Bryophytes produce male (antheridia) and female (archegonia) sex organs. Sperm produced in the male sex organs *swim* to the female sex organs where they fertilise the egg cells. Once fertilised, zygotes grow on to eventually become gametophytes which are what we recognise as green plants. *Water* is necessary for the sperm of bryophytes to swim to the female sex organs - a legacy borne of their marine origins.

Spore *morphology* – the shape and patterns of the spores – is an important factor in identification so it may be necessary to grow on collections of *Fossombronia* until spore-containing capsules are produced.

So, is *Fossombronia* a *leafy* or a *thallose* liverwort? This can be confusing, but *Fossombronia* is a *thallose liverwort* even though its bright green structures look like *leaves*, almost like those of miniature lettuces, in fact, they're crisped and corrugated, thin, upright *leaf-like lobes* inserted into a fleshy stem. And as if this were not enough, the *rhizoids* are bright crimson.



Viewed under a microscope, sculptured spores of *Fossombronia* are necessary for identification. Photo: R J Oldfield

Fossombronia species can be abundant and widespread. The genus is often an important component of biological soil crusts which may comprise varying combinations of cyanobacteria (blue-green algae), bacteria, algae, fungi, lichens, mosses and liverworts. Soil crusts play an important role in minimising soil erosion, both by wind and water, particularly in semi-arid and arid regions of Australia.



Fossombronia (the plants with crinkled 'leaves') growing with mosses in a moistened biological soil crust.

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Australian National Botanic Gardens, Canberra:

<https://www.anbg.gov.au/bryophytes>

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<https://vicflora.rbg.vic.gov.au/flora/search?q=%2aFossombronia%2a>



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