

Lichens

the poor little peasants of Lake Muir Nature Reserve

Rustici pauperrimi (The poor little peasants of nature) C Linnaeus (1707-1778).

An attractive feature of Lake Muir, which lies east of Manjimup, is the presence of a large display of odd shaped and colourful lichens.

by Ray Cranfield and Richard Robinson

Mist layers dissipate, presenting a scenic vista across Lake Muir, and opening a unique window into the lake's natural diversity. A myriad life forms make up the ecology of its rocky eastern shoreline.

The diversity in any landscape consists of many recognisable layers, some of which are readily observed. One group of organisms that is often overlooked belongs to a section of a larger flora known collectively as cryptogams. Cryptogams are plants that produce spores instead of seeds and include the ferns, lichens, mosses and liverworts. Lichens, referred to by Linnaeus as 'The poor little peasants of nature', can be found in large numbers around Lake Muir. Careful searching will be rewarded by a range of unusual structures and forms that can be either microscopic, with a hidden beauty, or large enough to be observed unaided.

LICHENS

Lichens can be classified into simple, non-taxonomic groups based on their structure or growth form. The simplest growth form is a flat crust that adheres to the surface of bare rock or wood, often resembling a splash of paint or a bird dropping. Leafy forms are anchored to their favoured surface by a



mass of short hair-like roots called rhizines, and coral-like species can often be seen growing among moss on old logs or on the ground. Beard-like species hang from the branches of living and dead trees and shrubs. In long dry periods, lichens will dehydrate and go into a resting phase. On rewetting, they will resurrect and hydrate back to their former 'living' state.

Lichens are a symbiotic partnership between algae and fungi, sometimes existing apart, but preferring to co-exist. The mechanism of how these two partners find each other is virtually unknown and is one of the mysteries of nature. In the autumn-winter period,

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Main: *Xanthoria ligulata*.

Insets from top: Fairy castles (*Cladonia cervicornis*), *Heterodermia dendritica*, *Pseudocyphellaria neglecta* and reindeer moss (*Cladia aggregata*).

Left: A lichen-covered tree on the shoreline of Lake Muir.

Below left: The whimsically-named fairy castles.

Below: *Neofuscelia glabrans* has greyish-green lobes.

Bottom: The crusty white lichen *Ochrolechia* sp.

the fungal partner forms fruit bodies that arise from the surface of the plant. At Lake Muir, many of the lichens form small disc-shaped fruits either directly on the surface of the plant or on the ends of tall trumpet-like stalks or hanging branches. Lichens were first noted in the third century BC. Further studies occurred during the fifteenth and sixteenth centuries, where records show that they were described in herbals (the earliest medical texts, which published cures based on extracts prepared from natural resources). The development of the compound microscope, during the nineteenth century, encouraged early





botanists to study and advance the understanding of the lichen floras. Today, lichenologists have an impressive array of tools available, which include chromatography methods and chemical spot tests, to assist in the determination of genus and species.

Only a small number of lichen species are known by common names. Many species found in Australia have worldwide distributions and single species have become known by a variety of common names. This has resulted in a high degree of confusion that often leads to mistaken identifications. In many instances, although interesting to lichenologists, lichens may appear

insignificant and do not stimulate the development of common names. This has not deterred serious naturalists from having fun by coining a few interesting common names. Examples of fairy castles (*Cladonia cervicornis* subsp. *verticillata*), old man's beard (*Usnea* species), cow's udders (*Ramalina inflata* subsp. *australis*) and reindeer moss (*Cladia aggregata*) can all be seen at Lake Muir.

DISPLAY AT THE LAKE

Lichens can be spectacular when seen massed. They can produce outstanding displays of bright colours, intricate patterns or a combination of

both. Many of the smaller lichen species require a lens or microscope to study their structures, but examining them is well worth the effort. Lichens can be found on most stable surfaces and, while some can tolerate conditions that are extremely harsh and exposed to the elements, others prefer secluded protected niches. Lichens have been recorded growing upon some unusual objects, such as old car bodies, broken glass, china and the roof tiles of older houses. Although most stable surfaces provide a place to develop, not all contribute or provide food requirements for lichen growth. The algal partner converts energy from the



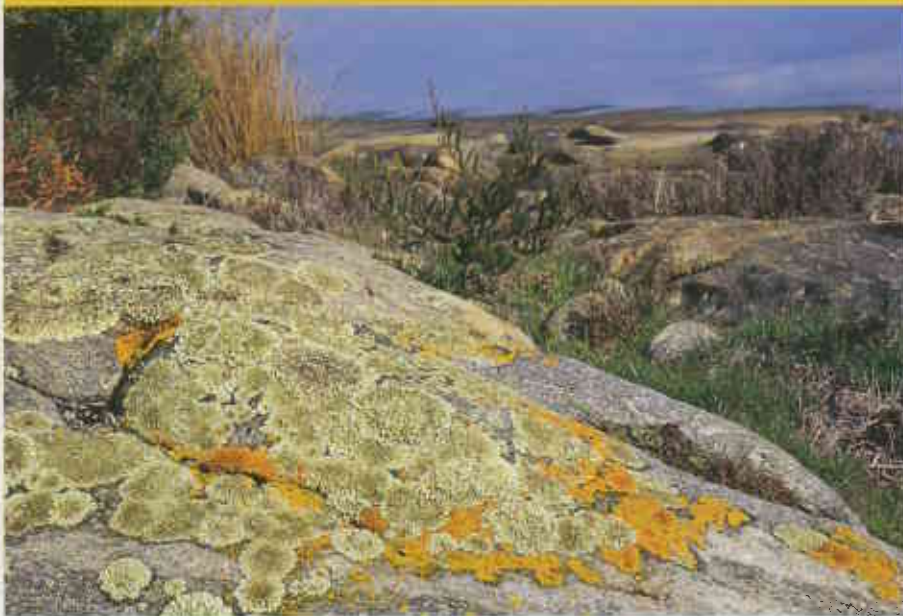
- Top: The lichen *Ramboldia stuartii* resembles fly spots.
- Top right: *Pyrrhospora laeta* forms a reddish-orange crust on branches.
- Above: Old man's beard (*Usnea scabrada*).
- Right: The lichen *Hypogymnia subphysodes* has a greyish-green 'leafy' growth form.

LAKE MUIR

Lake Muir was named in honour of farming pioneers of the south-west of Western Australia. The Muir family still farm in the area. The lake was located by Thomas Muir after local Aboriginal people told the family (then based near Mount Barker) that a large body of water could be found further west towards what is now known as Manjimup. The lake was found to be extensive and covered in large flocks of ducks and other waterbirds on what appeared to be a reasonable source of permanent water. In 1856, Thomas's brother Andrew built a two-roomed paperbark hut on the lake's eastern shore at Nabagup where he embarked upon various agricultural pursuits, including wheat and livestock farming.

The Muirs forged botanical links with Baron Ferdinand von Mueller, an eminent botanist based in Melbourne during the early colonial years of Australia. They collected local plant specimens and sent them to Melbourne, assisting in the discovery and understanding of Western Australian flora. In 1873, the rope sedge *Lepyrodia muirii* was named by von Mueller in recognition of the Muir's contribution to the botany of the area. In 1877, Thomas and Andrew Muir hosted a visit by von Mueller to the Lake Muir and Nornalup areas.

Wheat farming at Nabagup lasted only a few years, but stock has been run on this property since, and today wild horses can still be seen in the area. Tree farming (pines) has replaced much of the older agricultural practices on the eastern shores of the lake, adjacent to what now forms the Lake Muir Nature Reserve.



sun, in a similar manner to that of plants, and the fungal partner gains nutrients from the surface on which the lichen grows and from atmospheric particles through breakdown and absorption.

The most commonly colonised natural surfaces found around the shoreline of Lake Muir are granite and quartz rocks, old fence posts, and the branches and stems of dead and living shrubs and trees.

The lichen flora at Lake Muir is quite diverse. The reason for this diversity is not fully understood, but it is likely to be the result of a mosaic of suitable niches, surfaces and hosts in a small area. This includes an abundance of suitable plant species, rocks with variable aspects and a contrasting but cyclic annual climate regime, which allows species suited to both wet and dry environments to co-exist. During a brief visit to the eastern shoreline of Lake Muir, the authors collected 60 specimens, which represented 18 families and 26 lichen genera. It is expected that any further collecting opportunities around the lake's perimeter will find previously unrecorded species or subspecies, some of which may represent new records for Western Australia.

Above left: Shoreline rocks at Lake Muir covered by *Xanthoparmelia* sp. and *Xanthoria ligulata*.

Left: *Teloschistes chrysophthalmus* (left) and *Menegazzia* sp. (right) grow together on trees and shrubs.

Above: *Xanthoparmelia* sp. has greyish-green lobes.



A quick glance around the lake's eastern edge will present a riotous splash of colour and form. On the rocky granite outcrops, leafy or lobed species may be either quite large-lobed and loosely attached or small-lobed, flat and firmly attached. Leafy or lobed species range in colour from yellowish-orange (*Xanthoria ligulata*) and reddish-brown (*Pseudocyphellaria neglecta*) to greyish-green (*Xanthoparmelia* sp.) and olive (*Neofuscelia glabrans*). Other species form flat crusts that grow in circular or irregular patterns (*Rhizocarpon* sp.).

Trees and shrubs host a wide range of species that may be yellowish-green and beard-like (*Usnea scabrida*), bright yellowish-orange tufts (*Teloschistes chrysophthalmus*), greyish-green forms resembling cow's udders (*Ramalina inflata* subsp. *australis*), or flat and scaly (*Menegazzia* sp.). There are also crusty reddish-orange (*Pyrrhospora laeta*) or white (*Ochrolechia* sp.) forms. On moss-covered, decaying logs, tiered forms that resemble tiny grey castle towers (*Cladonia cervicornis* subsp. *verticillata*) and coral-like species (*Cladia aggregata*) can be found. Greyish-green leafy or lobed species (*Heterodermia dendritica* and *Hypogymnia subphysodes* var. *austeroides*) and a black species that resembles fly spots (*Ramboldia stuartii*) like the bare wood surfaces, including old fence posts. On the more sheltered trunks, one may find a strange olive green jelly mass (*Collema* sp.) that dries to a brittle black film adhering to the bark surface. Using a lens, and closely examining the decaying wood, can reward lichen hunters with sightings of



the tiny stubble lichen (*Calicium glaucellum*), which appears as a mass of individual black structures 0.25 millimetres tall.

The more you look for lichens at Lake Muir the greater the experience, as an expanding diversity of forms quickly becomes apparent.

Above left: Lichen on fence posts at Lake Muir Nature Reserve.

Above: Cow's udders (*Ramalina inflata* subsp. *australis*).

Ray Cranfield is a Senior Technical Officer (Botanist) with the Department of Conservation and Land Management based at the Manjimup Research Centre. He is researching the WA lichen flora, with emphasis on the southern forest region, and can be contacted on (08) 9771 7976 or by email (rayc@calm.wa.gov.au).

Richard Robinson is a Research Scientist with the Department of Conservation and Land Management also based at the Manjimup Research Centre. He is researching fungal biodiversity and ecology, and can be contacted on (08) 9771 7997 or by email (richardr@calm.wa.gov.au).

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All photos by Richard Robinson.

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LANDSCOPE



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Once thought to be extinct, Gilbert's potoroo has overcome many obstacles. What is being done to improve its chances of survival? See page 28.



Cane toads are poisonous, prolific breeders and are getting closer to the WA border. Hop to page 10.



Discover some of the prehistoric megafauna that once roamed the State in 'Walking with WA giants' on page 23.



The tuart once typified the coastal strip north and south of Perth. Why should we cherish this majestic tree? See page 16.



Lichens decorate Lake Muir, near Manjimup, with varying colours and shapes. Turn to page 43 to learn more about these fascinating life forms.

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Illustration: Gooitzen van der Meer.
Cartography: Promaco Geodraft.
Marketing: Estelle de San Miguel ☎ (08) 9334 0296 Fax: (08) 9334 0498.
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COVER

Royal hakea rises above the surrounding heath, straight and column-like. When sunlit from above or below, its unusual large variegated leaves appear to glow like lanterns, so the shrub is also known as the Chinese lantern bush. Among the birds that obtain nectar from its flowers (hidden at the base of the leaves) is the western spinebill.

Royal hakea grows almost exclusively in Fitzgerald River National Park, an area that was reserved on the recommendation of then Government Botanist Charles Gardner (see 'Botanic Guardian' on page 36).

Cover illustration by Philippa Nikulinsky

