

Two is company - the discovery of a new symbiotic relationship between a fungus and an alga

Stefan Siebert,
Nishanta Rajakaruna & Alan Fryday

Together with four co-workers from the USA, we have recently discovered a new genus of lichen that has been published in the [South African Journal of Botany](#). What makes this even more noteworthy, is that the last time a new lichen genus was described from South Africa was nearly three decades ago! Below is a rundown of the background and significance of the find.

In their simplest form, lichens represent a symbiotic relationship between a fungus and an alga but recent research has shown that several other micro-organisms are also present and they are better considered as microbiomes. South Africa's lichens are not well studied, but two new species have recently been added to the country's [list of 1766 species](#) – a number which is widely regarded by international lichenologists to be a far cry from South Africa's true diversity of probably 3000 species. This estimate is based on the size of the country and the very diverse plant life. Unfortunately, this remains a situation that will not be addressed readily, as South Africa has no resident lichen taxonomist to pursue



A fruticose lichen on sandstone rocks on the Graskop plateau, Mpumalanga.

this exciting field. Discoveries of new lichen species are therefore largely dependent on visits by international experts.

The two new species were discovered during a National Geographic Society Expedition to study the lichens of serpentinites in Mpumalanga. Serpentinites are greenish, metamorphic rocks found along the renowned Barberton Greenstone Belt (Makhonjwa Mountains), which is home to some of the [oldest exposed rocks on earth](#). The serpentinites are interesting in that they hold



International lichen expert from Michigan State University, Dr Alan Fryday, collecting lichens from serpentinites near Barberton.

extremely high concentrations of heavy metals, such as nickel. This creates a toxic environment for most plant life and species associated with these rocks are highly specialized to survive.

In South Africa a lot of work has been done on the plants of these serpentinite areas in the Barberton region, which has resulted in the discovery of many new flowering plant species. Therefore, the NGS expedition set out specifically to target lichens, a poorly studied group, and to understand their association with these rocks. During this pioneering survey a new species of lichen was discovered and named *Scoliciosporum fabisporum* after its distinct bean-shaped [ascospores](#). This was an interesting find, as this was the first discovery of a new lichen species from serpentinite and could be the first of many unknowns from these harsh environments.

The expedition also stopped off at [Buffelskloof Nature Reserve](#) south of Mashishing in Mpumalanga. Here the biggest discovery of the entire expedition was made. Not only was a new species of lichenized fungi discovered at the base of the Calodendron Falls, but it also proved to be a new genus! This species is so distinct in its genetic make-up that it groups separately from other known lichen genera. So *Burrowsia cataractae* is really an exceptional find for South Africa. The genus was named in honour of John and Sandie Burrows, two very prominent and passionate stalwarts for plant conservation in South Africa. The species name refers to its habitat at the base of a waterfall where it was discovered.

During our survey we collected many other lichens that we could not name and further new species, or even genera, are expected.



A foliose lichen on a forest tree in the Blyde River Canyon, Mpumalanga.



Burrowsia cataractae, the new endemic genus from the Calodendron Falls in Buffelskloof Nature Reserve. Its morphology is crustose.

Photo credits: Stefan Siebert, Alan Fryday