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Hydatella inconspicua in Northland lakes

Maureen Young

The aquatic *Hydatella inconspicua* (Fig. 1) is known in New Zealand from seven western dune lakes in Northland, and some western Southland and Fiordland lakes. It has disappeared from two Northland lakes because of infestations of exotic weeds and fish. It is a tiny tussock-like plant with filiform leaves c. 2 cm long, green-brown at the top third and white below, and while it is usually submerged, it can be exposed when water levels fall in summer.

During the ABS Easter camp of 2007, Kevin Matthews from Awanui took us to Lake Ngatu, and showed us a population at the southern end of the lake. The plants are monoecious, and one plant showed the minute red, globular fruit held between chalice-shaped bracts. This is the type locality for the plant. It was first collected there in 1906 for Cheeseman by Kevin's great-great uncle, R.H. Matthews and his friend, H. Carse. Ten days after the ABS camp I was at Lake Ngatu again, this time with a team of NIWA aquatic ecologists and Lisa Forester from the Northland Regional Council. Kevin joined us for the visit, and this time he found another good patch at the north eastern side of the lake. By this time I was beginning to understand that the plant is usually completely obscured by a coating of blue-green algae, making it difficult to locate.

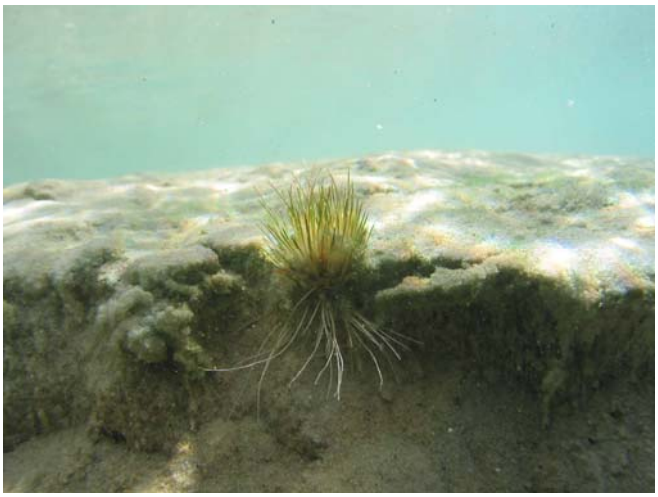

Fig. 1. *Hydatella inconcpicua* . Photo: Rohan Wells.

Over the next two days of exploring the Kai Iwi Lakes, south of Maunganui Bluff, I had plenty of time to become familiar with *Hydatella* and the conditions that favour its growth, as it is present in all three lakes. As Paul Champion pointed out to me, it grows best where water conditions are calm and still. Although it seems not to grow where there is a thick growth of sedges around the edge of the lake, it is often found where there is sparse growth, often of *Baumea arthrophylla.* In the clear waters of these lakes it can grow down to 2 m depth. I found the best way to locate it in shallow water was to gently polish clumps of blue-green algae with my bare toes, and if there was a little hummock beneath, then it was *Hydatella*.

As we moved down to the Pouto Peninsula, the unprepossessing Lake Rotokawau was visited. This lake has grazing down to the edge in some places, and pines growing to the edge in others, with very few emergent sedges and herbs. However, it is the stronghold for *Hydatella.* We had hardly left the vehicles before we noticed that there was a ring of tiny plants washed up along the shoreline. As I walked around the lake I saw, in many places, a sparse green fringe protruding from the water where it lapped the shore. This was the only lake where I saw the plant so close to the water's edge. This may be because the water level had lowered over the dry summer.

Paul informed us that new research had revealed that *Hydatella* was not a monocot as had always been presumed, but actually diverged from the main branch of flowering plants before the monocot/dicot split, and was more closely related to waterlilies. When I returned home I found that the botanical world was in a state of excitement over these findings.

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Hydatella inconspicua, New Zealand's most famous plant, phylogenetically speaking!

Graeme Hambly

As most of you know, genetic research has within the last 10 years dramatically changed our understanding of angiosperm relationships. In particular, the dicot-monocot split has been shown to be later in the origin of these plants, which leaves a diverse group of primitive angiosperms below this split. The most significant result is that *Amborella* from New Caledonia is basal (the term used is 'sister') to all current angiosperms species, with the water lilies on the second branch, and *Austrobaileya* (from tropical Australia) on the third branch. But the surprising news, some years after these results were first achieved, is that the second branch, the water lilies, has a new 'sister' below them, which is the Hydatellaceae (Saarela et al. 2007), a very small family of very small aquatic plants from Australasia (though a species has recently been discovered in India). In New Zealand, we have one species, *Hydatella inconspicua*, which for long was thought to be confined to some small fresh water lakes in Northland, though it has recently (1993) been discovered in the South Island.

The distinctive nature of these plants was first recognised over 30 years ago by U. Hamann (1976), before relevant genetic methods were developed. He provided a careful morphological analysis. At that time, these genera were included in the Centrolepidaceae. Hamann not only put them in their own family, but also in their own order – a very high level of taxonomic distinctiveness. In particular, he noted features that typify the most primitive