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# Records of the chrysophyte alga *Synura uvella* Ehrenberg 1834 from Loch na Thull and Loch Merkland, Sutherland, Scotland

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*Synura* is a genus belonging to the group of algae known as chrysophytes ("golden plants"), which are single-celled or colonial flagellates. They possess unequal flagella with a characteristic brown fucoxanthin chloroplast pigment giving them a golden-brown colour when examined live. *Synura* cells are surrounded by silicaceous scales, examination of which is the most important means of identifying them. Although some species can be identified using light microscopy, for most chrysophyte taxa scanning or transmission electron microscopy is necessary (Kristiansen & Preisig, 2007).

*Synura* spp. are widely distributed but not common, and are mostly undocumented (Reynolds & Irish, 2000; John *et al*., 2011). John *et al*. (2011) detailed 18 known species at the time of publication (with six species recorded from the British Isles), whereas the current information details as many as 57 species world-wide (Guiry & Guiry, 2024). *Synura* spp. and chrysophytes in general occur mainly in oligotrophic and mesotrophic waters, usually in spring following periods of nutrient depletion. Their distribution is related to pH such that where there is a plentiful supply of dissolved carbon dioxide, chrysophytes will be more abundant, whereas in waters that are buffered by bicarbonate and the pH is elevated due to higher phytoplankton production, chrysophytes are less common (Reynolds, 1997). Many chrysophytes can be a nuisance when in bloom and impart a fishy odour and unpleasant taste to water.

I report here that *S. uvella* has been recently identified with certainty from two Scottish Lochs - Loch na Thull and Loch Merkland, both Sutherland (Fig. 1). The records were from a sub-surface sample collected during July 2023 from Loch na Thull, and during September from Loch Merkland 2023, using a throw sampler. Samples were preserved with Lugol's solution in the field, and analysed later by the author using an inverted microscope following standard procedures (Brierley *et al*., 2007). Identification was based on colony and cell appearance, following keys in John *et al.* (2011), Kristiansen & Preisig (2007), and Tikkanen (1986).

**Fig. 1.** Spiny colony of *Synura uvella*, Loch Merkland, Sutherland, Scotland, September 2023. Lugol's preserved sample. The cells are 20 x 8 µm in size. The black line is part of an eyepiece graticule. (Photo: J. Krokowski)

*S. uvella* has been rarely reported or documented from the British Isles, although many other chrysophytes have been widely reported from Scottish freshwater lochs as part of loch monitoring by the Scottish Environment Protection Agency (SEPA). *S. uvella* was recorded from England by Harris & Bradley (1956) and from North Wales by Kristiansen (1979) who used electron microscopy of the silica scales for identification purposes. Regarding previous Scottish records, *S. uvella* was present in samples collected by Bradley (1966) "from ponds, ditches and flood water" near Edinburgh and there is a 2006 record from the south end of Loch Lomond whose source is SEPA's *River Macroinvertebrate Data for 2005 and 2006* (National Biodiversity Network, 2024).

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