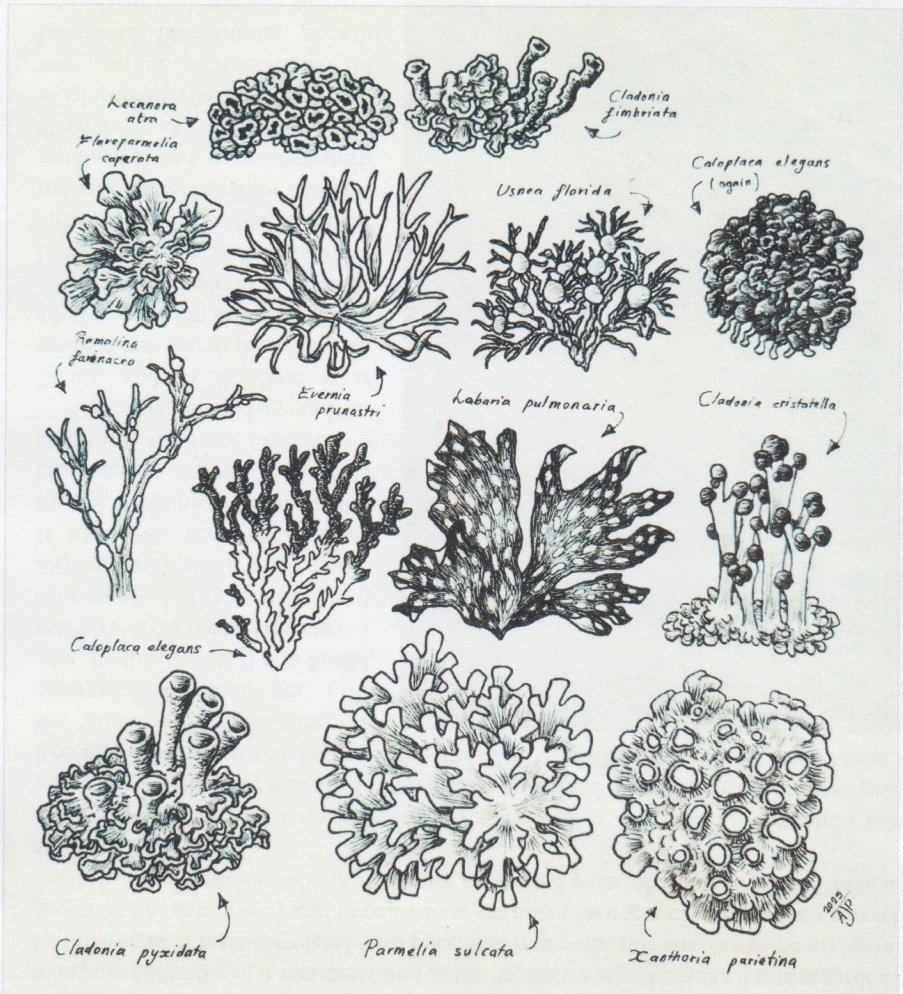
British Lichen Society
Bulletin



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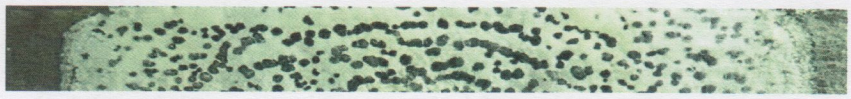

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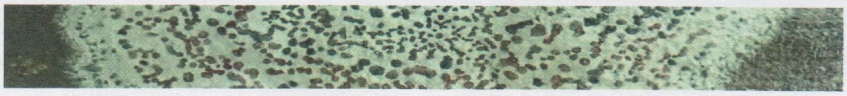

I think we need to build an evidence base of what has worked and what hasn't. Long-term monitoring will be key as this project has shown. I am interested in collecting case studies of lichen translocations (or bryophytes or fungi if you have got any). The collection could provide an evidence base and comparison resource for the effectiveness of translocation for lichens in different habitats using different methodologies. I have a strong preference for translocations that occurred more than one year ago but would like to hear about any recent ones too. You can email me at kat.obrien@nature.scot for more details.

More information about the original translocation project can be found in

NatureScot Commissioned Report 913 - Feasibility study - translocation of species for the establishment or protection of populations in northerly and or montane environments tinyurl.com/naturescottranslocation

Or

Tiny niches and translocations: The challenge of identifying suitable recipient sites for small and immobile species tinyurl.com/BESjournal

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The nuisance alga – *Klebsormidium crenulatum* or *Apatococcus ammoniophilus*?

Lichenologists in Europe have in the past decades become aware of an increasing dominance of an epiphytic filamentous alga (Søchting 1997, Frahm 1999).

It has been assumed to be the result of increased ammonia deposition originating from expanding husbandry, and to represent a threat to lichen diversity and vigour. There has, however, been a constant uncertainty about its taxonomic affiliation and scientific name, but the name *Klebsormidium crenulatum* has been broadly used.

Provoked by a significant expansion of filamentous algae on particularly conifer bark and needles in the western part of Denmark (Fig. 1) a study of the filamentous alga was performed that surprisingly showed it to be an undescribed species of *Apatococcus* (Søchting *et al.* 2025). *Apatococcus* is the genus dominating the well-known powdery green biofilm on shaded bark. The new, filamentous representative of this genus was given the name: *Apatococcus ammoniophilus* Søchting, Friedl & Moestrup.

In England *A. ammoniophilus* is abundant on conifers, especially dead *Larix* twigs in exposed situations; it was described as the 'nuisance alga' because it was regarded to be causing or at least correlated with poor lichen growth. It is also common on lignum (fence posts, gate posts) and conspicuous on north-facing rock exposures, especially north-facing dry-stone walls in the more populated parts of England where there are acidic rocks.

In a study made on a north-facing dry-stone wall in the Lake District eight areas with 100% cover were scrubbed clean and re-examined over the course of three years. Recovery was measured by removing the alga by further scrubbing from some of the areas with estimation of chlorophyll content per unit area. By this means it was found that a 10–25% recovery occurred over a period of 15 months. Full recovery took about three years. It has been seen to smother the macrolichens *Stereocaulon vesuvianum* and *Parmelia saxatilis* in the same district.

The alga is widespread in Wales, and in Scotland it is present but scarce in areas with a low population density.

A. ammoniophilus has never been found on walls and hard substrates in Denmark, where the true *Klebsormidium* has also not been found. In northwestern Germany *A. ammoniophilus* is abundant like in Denmark, but earlier observations of luxurious filamentous growth on the trunks of trees in Western Germany (Frahm 1999, Stapper & Franzen-Reuter 2004) may actually relate to the true *Klebsormidium crenulatum*.

Over the page we describe the two species, *A. ammoniophilus* and *K. crenulatum*, but the taxonomy of the latter species may not be fully understood.

Figure 1. *Apatococcus ammoniophilus*. On pine, Fanø, Denmark (2024).

... it was described as the 'nuisance alga' because it was regarded to be causing or at least correlated with poor lichen growth

Apatococcus ammoniophilus Søchting, Friedl & Moestrup

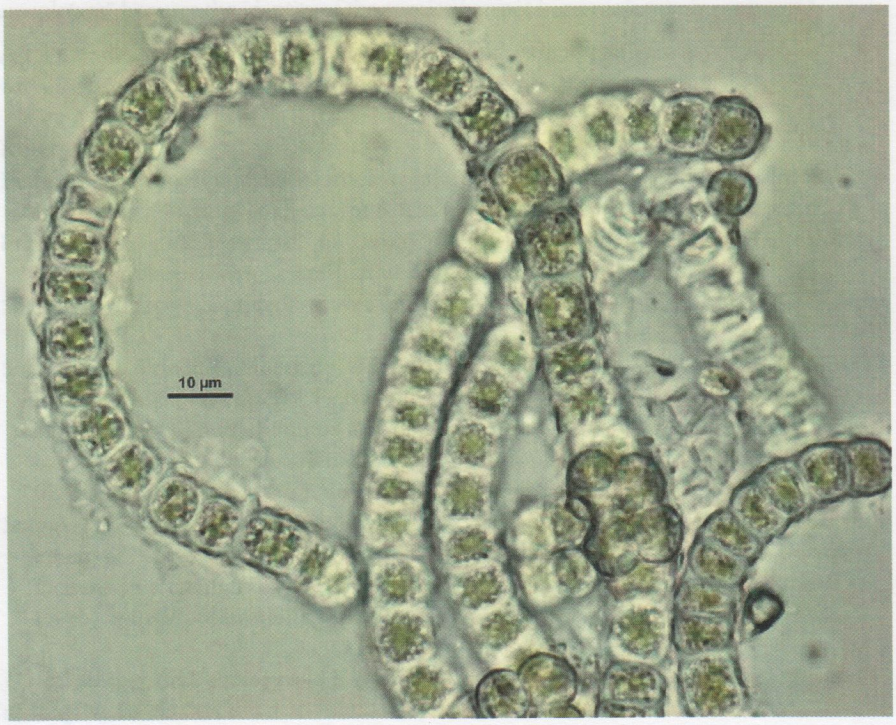


Figure 2. *Apatococcus ammoniophilus* in water. Rømø, Denmark (2022)

Thallus forming up to 2 mm thick, light-green mats (Fig. 1) consisting of unbranched, *c.* 10 µm wide, uniseriate filaments with very gnarly surface and flat, lobed chloroplast with lack of pyrenoids (Fig. 2).

Mass occurrence on light exposed bark of particularly conifers is common in ammonia exposed environments in western Jutland.

For more information (in English) and access to additional relevant literature consult the home page: **gylletraad.dk.**

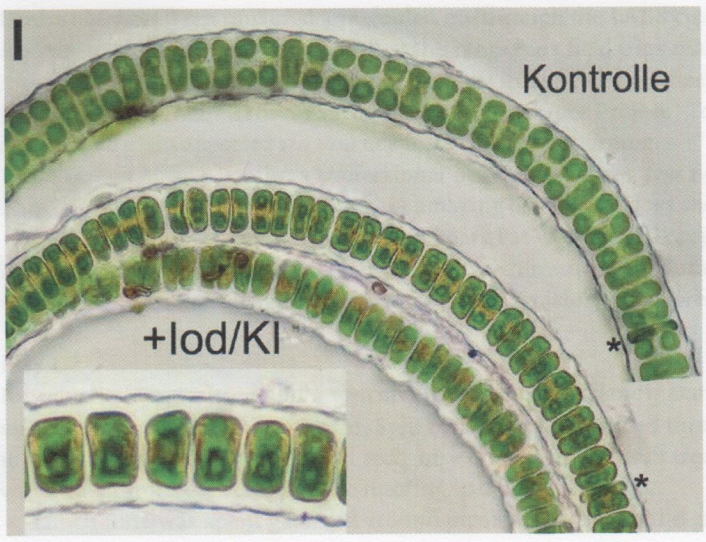
Klebsormidium crenulatum (Kütz.) Lokhorst

Thallus forming 0.1 up to 1 mm thick, green mats (Fig. 3) consisting of unbranched, *c.* 19 µm wide, uniseriate filaments. Each cell has a ribbon-shaped, parietal chloroplast containing one or more spherical pyrenoids. These are coated with starch, which turns blue when iodine is added (Fig. 4).

Frahm (1999) concluded that epiphytic *Klebsormidium* flourishes by eutrophicating

emissions. In an epiphyte mapping study of North Rhine-Westphalia, Stapper and Franzen-Reuter (2004) observed the typical dark green algae lawns between and above mostly nutrient-tolerant lichens and mosses on two-thirds of all tree trunks examined. The trees examined were located along country roads, but also in cities such as Bonn, Düsseldorf, and Gütersloh. Data analysis showed that frequency and algal coverage of the phorophyte stem was positively correlated with transport emissions. Even though frequency and the degree of coverage have decreased in recent years, there is still a statistical correlation between traffic congestion and urban overheating in Düsseldorf (Stapper, unpublished). This supports the idea of using epiphytic *Klebsormidium* algae together with

Figure 3. *Klebsormidium* cf. *crenulatum* growing over foliose lichen *Parmelia sulcata* on a Maple tree in Dortmund, Germany (2000).



Left:
Figure 4. *Klebsormidium* cf. *crenulatum* from a maple tree in Düsseldorf (2020). Identical filament once in water (control, "Kontrolle") and after treatment with diluted Lugol's solution (+iodine/KI). Scale bar: 10 µm.

mosses and lichens for urban climate biomonitoring. We still use the designation "*K.* c.f. *crenulatum*" because the identity of the species has not been molecularly confirmed.

An illustrated document on *Klebsormidium crenulatum* is available at www.moose-flechten-umwelt.de.

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Correction

The image on the cover of *Bulletin* vol. 136, and the photographs on page 16 erroneously named as *Minutoexcipula tuckerae* were in fact those of a *Lichenodiplis*. The author would like to apologise to the Editor and readership for this error.

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