

Staurastrum uhtuense Grönblad 1921

Chris Johnson

CDN.Johnson@protonmail.com

Introduction

During fieldwork in the Outer Hebrides, I came across a very rare species, *Staurastrum uhtuense*, which is only known from a few localities in the world. That provides enough reason to pay more attention to this species.

Description of the Outer Hebridean cells

(figs. 1-4)

Cells about as long as broad to marginally longer than broad. Sinus V- or wedge-shaped and always open, the cell body is rectangular with long processes set at about 45 degrees. They have about eleven evenly-spaced denticulations circulating the processes, tipped with two medium-sized spines. The semicell near the isthmus has a broad protuberance supporting three denticulations, the centre one being largest. There are paired denticulations at the basal angles. Side view is fusiform with an oval-shaped invagination, almost closed at the extremity by the downward-pointing central spine. Apical view is diamond-shaped with a rounded central protuberance.

Overall dimensions: L. 58-62 μm , B. 50-59 μm , ls. 7.0-7.1 μm , Th. 12.1-18.7 μm .

In June 2023, a good population of this taxon was found in Loch na Creige, North Uist, Outer Hebrides (Lat: 57.643861°N Long: 7.225150°W) (fig. 5). Samples were taken with a plankton net at the stony, shallow, exit-end of an otherwise deep loch, with an almost neutral pH 7.2. The simple flora comprised *Lobelia dortmanna* and *Juncus bulbosus*. The loch in total is oligo-mesotrophic.

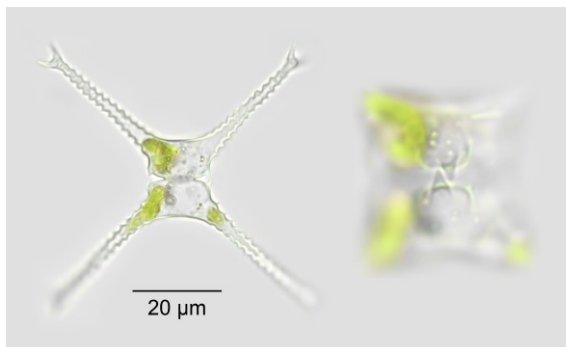


Figure 1. *S. uhtuense*. Enlarged central section showing the larger, middle teeth. © Chris Johnson.

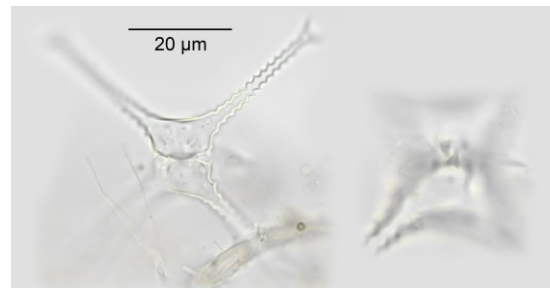


Figure 2. *S. uhtuense*. A dead and twisted cell showing all six teeth on the enlarged section. © Chris Johnson.

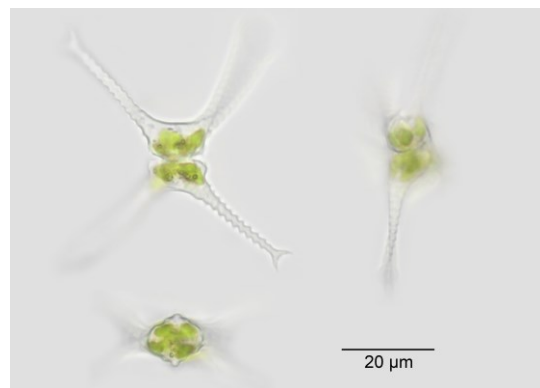


Figure 3. *S. uhtuense*. Showing side and apical views. © Chris Johnson.

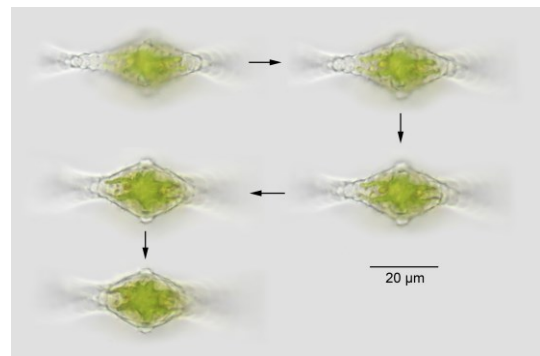


Figure 4. *S. uhtuense*. Apical views at different focal points. © Chris Johnson.



Figure 5. Loch na Creige, North Uist, Outer Hebrides. © Christine Johnson.

Discussion

This very rare desmid was first described by Grönblad (1921, p. 60, pl. 5: 30) from a single specimen found at Uhtua (Ukhtinskaya), Karelia in Northern Russia. The species was named after this site. The main features are the divergent angle of the processes and the three denticulations (he called them warts) just above the isthmus. Overall dimensions given: L.72, B. 62, Is. 8 µm. He comments: 'This characteristic species has been observed only once. I know no species with which it could be confused.' He then draws attention to *S. columbetoides* West & West 1902 without further comment (see discussion of that species below) (fig. 6).

In 1938 he found another example in South-West Finland, (Grönblad, 1938, p. 55, pl. 2: 1) which was slightly smaller. Overall dimensions given: L. 48, B. 48, Is. 8 µm. This would also seem to be a single specimen. He comments that this cell is smaller and the elevations near the isthmus are at slight variance, but considers these differences insignificant in view of only two cells being found (fig. 6).

A tropical species found in Ceylon (now Sri Lanka): *Staurastrum columbetoides* West & West (1902, p. 186, pl. 22: 8-9) has been likened to *S. uhtuense*, but it is not a view shared here. They are morphologically quite different. The processes are extremely divergent, the semicell body has rounded basal angles and lacks any dentition, there is no supraisthmial ornamentation, the isthmus is narrower and the sinuses have a rounded, dilate apex. Apical view is oval without any additional protuberances. The Wests comment: 'We know of nothing approaching this peculiar *Staurastrum*, with the body of a *Cosmarium* and the extraordinary diverging processes.' (fig. 7).

From a German tropical expedition, Krieger (1932, p. 195, pl. 15: 21) described *Staurastrum columbetoides* var. *intermedium* as being intermediate between *S. columbetoides* and *S. uhtuense*. His rather sketchy drawing seems to show features of both species. The features similar to *S. uhtuense* are diverging processes, quadrate semicells showing three supraisthmial denticulations, and the apical view is diamond-shaped with protuberances. More in keeping with *S. columbetoides* are the featureless semicell-walls, sinuses which have a rounded apex and a little dilate, and a narrower isthmus. It is also worth noting that in Krieger's (l.c., table 8, following p. 152) sample a pH of 5.1-5.5 is indicated. This is rather acidic compared with *S. uhtuense*'s circumneutral sample, and may suggest a different ecology (fig. 7).

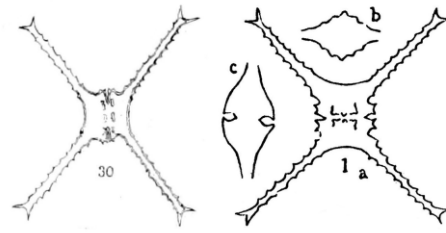


Figure 6. *S. uhtuense* images. Left from Grönblad 1921. Right from Grönblad 1938. Not to scale – for dimensions see the text.

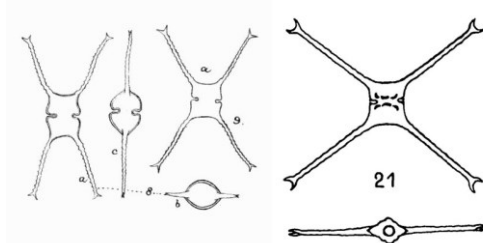


Figure 7. Left image of *S. columbetoides* from West & West 1902. Right image of *S. columbetoides* var. *intermedium* from Krieger 1932. Not to scale – for dimensions see the text.

Conclusion

S. uhtuense remains a very rare desmid and it is rewarding to add another site with a healthy population. I don't believe *S. columbetoides* has any link with the taxon under discussion. *S. columbetoides* var. *intermedium* has some similar features but too many differences to associate it with *S. uhtuense*. With just three finds from Russia, Finland and the Outer Hebrides, it clearly suggests an Arctic distribution, possibly with a coastal influence, being bordered by the White Sea, Gulf of Bothnia and the North Atlantic respectively. Neither of the Grönblad finds included information on the habitat or pH, which just leaved the Outer Hebridean data for assessment.

Acknowledgements

Thanks to the reviewers for helpful comments which have enhanced the text.

References

- Grönblad, R., 1921. New desmids from Finland and Northern Russia with critical remarks on some known species. Acta Societatis pro Fauna et Flora Fennica 49 (7).
Grönblad, R., 1938. Neue und seltene Desmidiaceen. Botaniska notiser, Lund, Sweden.
Krieger, W., 1932. Die Desmidiaceen der Deutschen limnologischen Sunda-Expedition. Archiv für Hydrobiologie, Supplement 11.
West, W. & G. S. West, 1902. A contribution to the freshwater algae of Ceylon. Transactions of the Linnean Society of London. 2nd Series. Botany, Volume 6, Issue 3.