Unearthing past environments
Pediastrum species composition and abundance in lake sediments from **Lake Diamond (LD)** in **sub-Antarctic South-Georgia**

Sofie Klem*, Maaike Zwier og Anne Bjune

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① What is *Pediastrum*?

Pediastrum is a common genus of green algae in fresh water. Their characteristic sporopollenin cell walls are often preserved as subfossils in lake sediments

② What can a paleoecological analysis of *Pediastrum* tell us about past environment?

Pediastrum species composition and abundance can be indicative of environmental factors such as **lake level**, **temperature** and **chemical composition.**

Research goal

Examine environmental factors in LD during the Holocene period by analysing *Pediastrum* species composition in sediments from LD

③ Materials and methods

- Sediment cores from LD were retrieved in 2011/2012
- Pediastrum was counted and identified in 15 pollen slides from one of these cores using a light microscope (objective lens 40x) and a species identification key. Data analysis was carried out in RStudio.
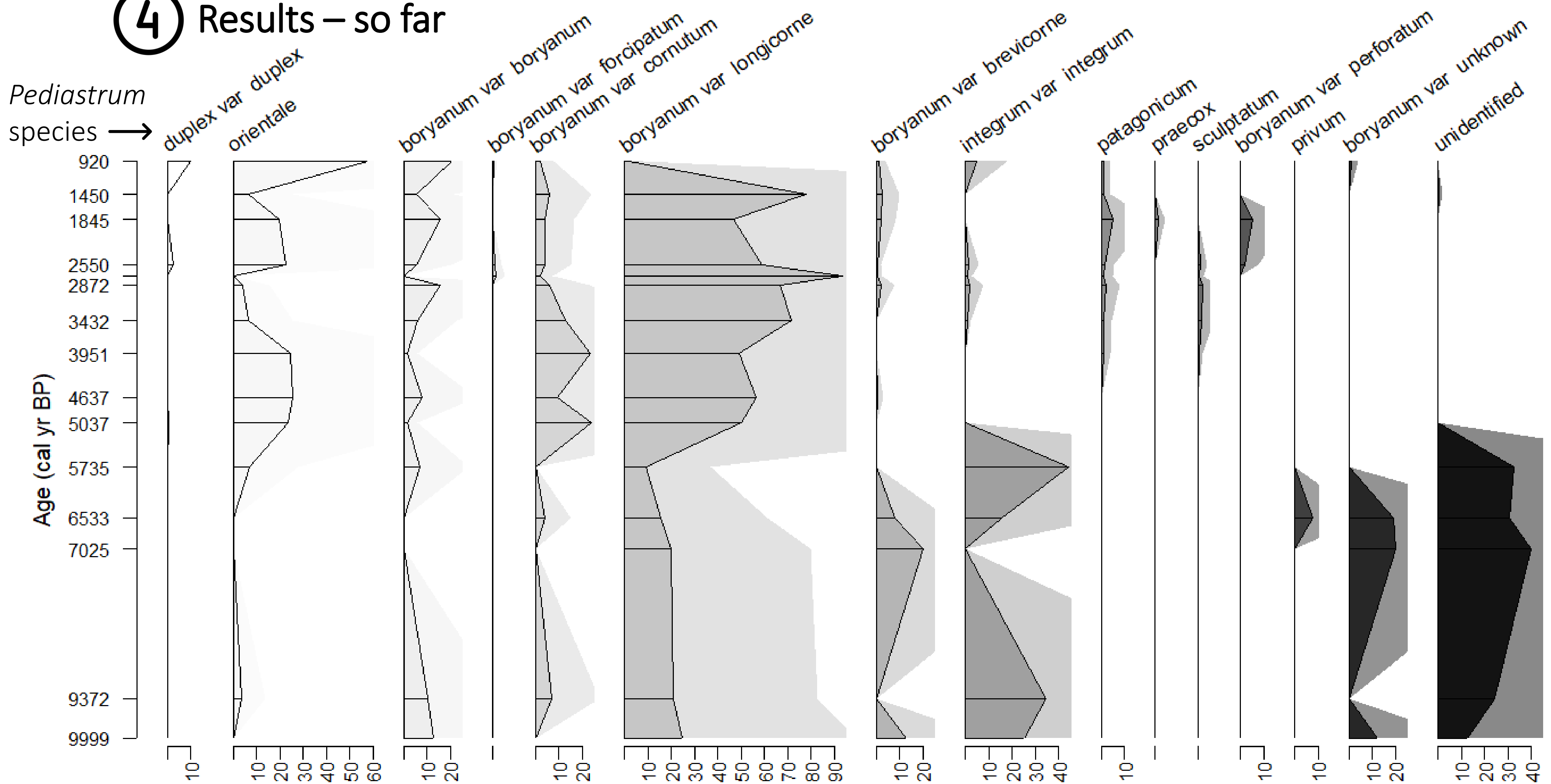
④ Results – so far

Figure 1: Stratigraphic line diagram showing the percentages of different *Pediastrum* species at different ages in the lake sediment sample

⑤ Interpreting the results – so far

A PCA analysis has been conducted, but further analysis is needed to draw conclusions

Questions I hope to answer with further analysis:
- What explains the +/- correlations between different species and the PC1 axis?
- What explains the observed (Fig.1) change in species composition around 6000 years ago?

Sources

Komárek, J. and Jankovská, V. (2001) *Review of the Green Algal Genus Pediastrum; Implication for Pollen-analytical Research*. Berlin: J. Cramer.

Zwier, M. *et al.* (2022) 'Pollen evidence of variations in Holocene climate and Southern Hemisphere Westerly Wind strength on sub-Antarctic South Georgia', *The Holocene*, 32(3), pp. 147–158.
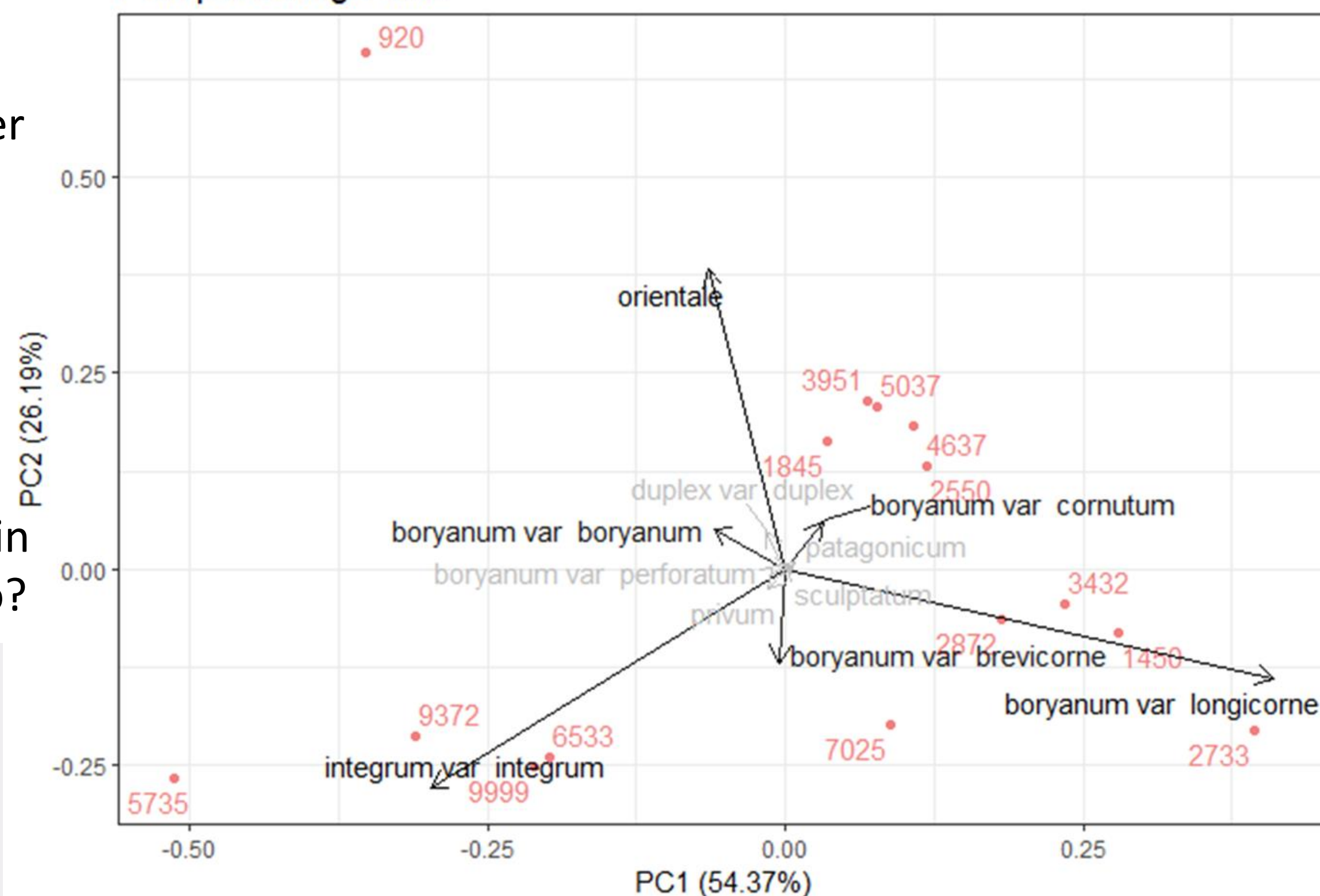
Contact info:
skl039@uib.no

Figure 2: PCA ordination plot: Excluding unidentified *Pediastrum* species, 54.37% of data variance can be explained by the PC1 axis.