

Disregarding morphological diversity - a *Larix* issue?



Figure 1: Male (yellow) and female (red) cones of *Larix*

Introduction

- Pollen bearing larches (Fig.1) at the Siberian treeline (Fig.2) are seldom, but also lacustrine sediments contain very low amounts of *Larix* pollen, which is contrary to the high larch coverage around arctic lakes. This underrepresentation of *Larix* pollen is known, but not entirely understood.

Our objectives are (1) to find morphological features that can be used for correct *Larix* identification and (2) to infer the ratio of unbroken pollen grains

Methods

We analyzed **185 fragments** of *Larix* pollen grains of **12 samples** from **4 different sites** (Siberian Arctic, East Germany and Central Germany). We recorded the presence/absence of **5 morphological features** of each individual fragment

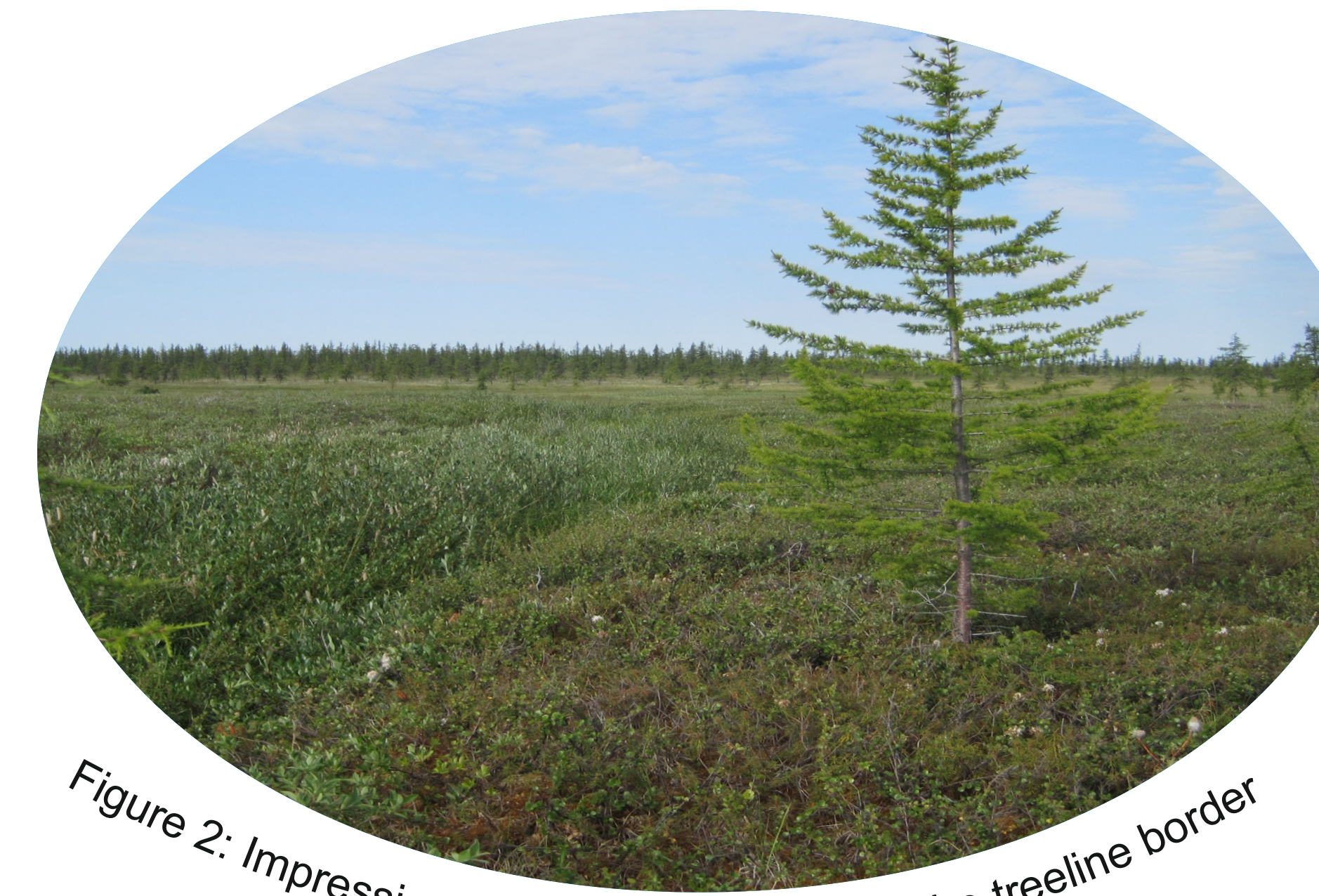
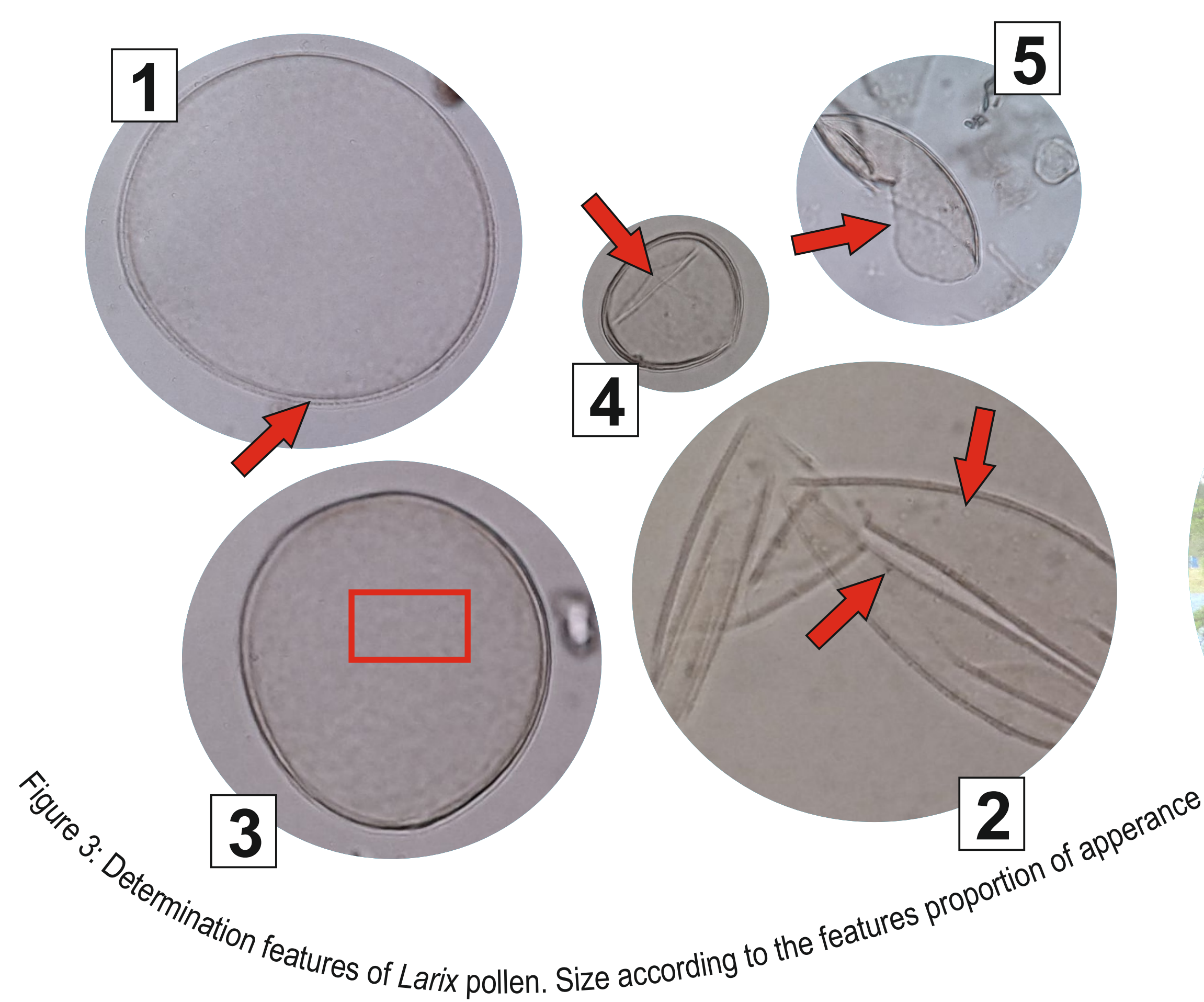


Figure 2: Impression of a single larch tree at the treeline border

Results

- ➔ Frequencies of morphological features do vary (Tab.1)
- ➔ Ratio equals a concentration of **~220 pollen/mL** (*Betula* ~ 2550 pollen/mL)
- ➔ Commonly used feature folding (Fig.3) is rarely present
- ➔ Grains tend to break in various pieces (Tab.2)



Classification	Frequency [%]	Fraction type	Frequency [%]
1 Double-layered, granular cell wall	87	part	37
2 Pseudo-Baculae	97	half	27
3 Granular patches	86	full	36
4 Foldings	27*		
5 Fissures (broken pollen)	38		

Table 1: Percentages of features found in a total of 185 *Larix* fragments.
*only based on fraction types „half“ and „full“

Table 2: The amount of fully preserved grains is small and complicates the determination of the real quantity of *Larix* pollen

Conclusions

- *Larix* grains show a variable combination of morphological features
- Frequency of full grains is small, compared to the quantity of fragments in a sample
 - ➔ A closer look may help to reflect the actual pollen load more accurately
 - ➔ Pollen accumulation (40 pollen/yr) is very low and deduction of vegetation is complicated