

Interactive comment on “Biological proxies recorded in a Belukha ice core, Russian Altai” by T. Papina et al.

Anonymous Referee #2

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Papina T. et al identified and quantified different biological species (pollen, cysts, and diatoms) in a Belukha ice core (Russian Altai). The first question emerged from the title: It does not specify which proxies were studied – climate change, paleoclimate? The abstract did not illuminate the situation much further. It said the main aim of the research was “to identify the main modern sources of biological records deposited in the Belukha glacier”. Only then does it become clear that the authors are trying to recover the relationships between studied biological records and types of modern dominant atmospheric circulation. Unfortunately, I do not feel that the authors achieve this target. In general, it was difficult to follow this manuscript.

General comments

Statistic treatment of biological data is completely absent especially for diatoms where
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the total number is quite low and high risk for doubt conclusions. I mean there is a high risk that conclusions may be unreliable.

There is some misunderstanding of what the source of the diatoms is? The authors mention (p. 2598) that the main source of diatoms are the nearest water bodies. But then in the last sentence they say that the Black Sea, the Aral and Caspian basins, and the water bodies of the southern Ural and northern Kazakhstan are the major sources of diatoms.

It was not clear why for 1983, the authors took completely different types of ECMs with main precipitation to interpret diatoms data and then to interpret coniferous tree pollen, and even for the same month – May (diatoms – 2b; coniferous pollen – 7b(s)), April-May (diatoms – 10a; coniferous pollen – 8d(s), (Tables 3, 5). What is the reason for this? Based on this, the conclusions regarding the sources of biological proxies do not seem reliable.

The text is unclear in some places, it is difficult to read and understand, e.g. the last paragraph on page 2597.

Specific comments

P.2591 Introduction Please, give a citation for Altai for the precipitation seasonality - “be deposited onto the glacier surface mainly with precipitation, but not through dry deposition because of the coincidence of seasonality in precipitation and pollen and algae production.”

Please, give another citation for the external moisture sources (the Atlantic, Arctic, Pacific Oceans) and for the Mediterranean and the Black Seas as the internal moisture sources

p.2593 Section 2.1 favorable – favourable [if English spelling]

P. 2594 Methods Though the authors used the description of methods from their previous paper (Eichler et al., 2011), nevertheless some important information was not

specified in the present paper. What is the mean annual accumulation rate for the site?
What was the resolution of sub-sampling?

P. 2595 Section 3.4. Probably the reference for Northern Hemisphere synoptic patterns should be the original one (Dzerdzevskii, 1968 but not 1975). Moreover, the authors say that it was described later by Barry and Perry, 1973.

P.2598 it could be explain - it could be explained

cosmopolitic forms – cosmopolitan forms

P.2607 Table 1 – give a citation for the original source

Interactive comment on Clim. Past Discuss., 9, 2589, 2013.