

Interactive comment on “A 560 yr summer temperature reconstruction for the Western Mediterranean basin based on stable carbon isotopes from *Pinus nigra* ssp. *laricio* (Corsica/France)” by S. Szymczak et al.

Anonymous Referee #2

Received and published: 2 August 2012

General comments: I also think that this paper provide a lot of interesting new isotopic data and useful paleoclimatic information for an unexploited region in tern of dendroisotopic studies. The study is very well conducted and explores several central aspects of the dendroisotopic approach, notably the correction of isotopic values related to changes in atmospheric CO₂ concentration. When discussing the results, authors also provide relevant information on the Corsican forest reaction to past and future climate changes. For these reasons, the paper is suitable for publication but requires some modifications. Indeed, some aspects of the study are questionable and have to be con-

C1039

sidered before the final publication. Some of them have been pointed out by referee #1 and, in many case, I agree with him\her. Among others, the approach consisting on tuning the isotopic data by applying different correction factors in order to obtain the highest correlations with climate parameters appears to me scientifically hazardous. Authors should have selected and applied the appropriate correction considering the context of their study (the pin-correction of McCarroll et al., 2009, seems the best in that case) and then worked with this single data set to reconstruct climate variables. In addition to this point, the two following should be considered. Specific comments: Selection of meteorological data set: The decision to use the climate data set from Italy to investigate the relationship between climate variables and isotopic values is questionable in the context of this study. The authors mentioned that they decided to use Italian data since Corsican data cover only 50 yr for some stations (P 2116, L 9-27). Indeed, Italian set offers a much longer record than the Corsican set, particularly for temperature and precipitation, which cover the period of 1901-2000. Surprisingly, we learn later in the text, that only a part of the Italian series (1951-2000) was used to calculate the correlations between isotopic values and climate variables because only few stations cover the early 50 yr. How can authors justify their choice of using the Italian climate data instead of the Corsican ones since the usable part of both series covers the same period? It could have important impact on climate reconstructions by distorting the relationship between isotopic data and climate variables. In fact, the weak correlations for precipitation are explained by the fact that “the precipitation signal of the Corsican mountains is captured only partly in the Italian data set” (P 2124 L 21).

Climate reconstruction: I’am not comfortable with the fact that authors use isotopic data from one site (Asinao) to reconstruct late summer temperature while they use the mean values of all 4 site to reconstruct cloud coverage and, later on, discuss past climate variations in the Western Mediterranean basin by comparing the two reconstructions with the same level of regional representativeness. If the objective of the study is really to reconstruct summer temperature for the Western Mediterranean (at least a regional scale), isotopic values from all 4 sites should be considered in regres-

C1040

sion model even if the temperature signal in the mean series is a little bit lower. The relevance of integrating the 4 sites in the temperature reconstruction is emphasized by similar significant correlations occurring in the same months for all sites.

Technical point: Authors should explain why they decided to analyse only one core per tree. Considering the circumferential variability of the carbon isotopic signals, it would have been preferable to analyse pooled material from 2 - 4 cores to get a signal representative of each tree. Isotopic series are often based on few trees, it thus appears important that individual signals integrated into the polled series are as closed as possible to the mean value of each tree.

Interactive comment on Clim. Past Discuss., 8, 2111, 2012.

C1041