**Looking for Holocene Pyrenean archives of Saharan dust deposition: The Arxuri peatbog and the Marboré lake**

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We investigate the input of Saharan dust in the western and central Pyrenees with multiproxy analyses of a 4 m long sediment sequence from the Arxuri peatbog (western Pyrenees) and a 7 m long sediment sequence from Marboré Lake (central Pyrenees). Recent episodes of Saharan dust in the Iberian Peninsula have yielded high dust deposition even in the western and central Pyrenees and available results from the DONAIRE project have evidenced that most of African dust input occurs as wet deposition and that in spite of the long distance from the source, the highest dust deposition in the Iberian Peninsula occurs in the Pyrenees. One of the aims of the POSAHPI project is to identify Holocene records of dust deposition in the Iberian Peninsula and to test geochemical techniques to characterize periods of higher dust input to lakes and peatbogs test if Holocene warmer periods as the current one were characterized by increased dust input and, consequently, we can expect more African dust in our atmosphere in the next future.

The Arxuri sequence is composed of a top unit of peat, an intermediate unit of lacustrine silt and a basal unit of coarse sand and silt. The preliminary 14C-based age model indicates that the two older lacustrine units are early to mid Holocene (< 9.5 ka BP) and the upper peat unit spans the last 3500 years. The Marboré sequence is composed of finely laminated silts and spans the last 14.6 ka.

We use scanner XRF ratios to identify periods with higher Fe deposition that could be related to higher Saharan dust input. Although variable terrigenous input from the watershed and changing diagenetic conditions in the peatbog and the lake may have affected Fe fixation in the sediments we hypothesize that Fe/Ti ratios may serve as an indicator of excess Fe brought by Saharan dust. The Arxuri Fe/Ti record shows relatively lower values during the lacustrine phase (10- 4 ka BP) and higher and increasing during the peatbog phase (last 4 ka). The Marboré sequence has higher Fe/Ti values than Arxuri, but and with a smaller range; Early Holocene values are also relatively lower than late Holocene values and intervals with values higher than 6 are more frequent during the last 4000 years. The preliminary data are coherent with available dust records in central Europe and the western Mediterranean pointing to several periods of enhanced dustiness during the Holocene punctuating a general increasing trend during the late Holocene after the end of the African Humid Period (ca. 7 – 4.5 ka BP) (Le Roux et al., 2012, Martínez-Cortizas et al., 2019).

In Arxuri there are two main intervals with Fe/Ti >6 located at 1 m and 0.5 m depth. According to the preliminary age model, the top one could correspond to the arid Medieval Climate Anomaly (MCA) and the lower one to the Roman Period, both warmer and with some arid phases when higher dust influx was expected. The Marboré sequence shows several high Fe/Ti intervals during the last centuries of the Little Ice Age, around the MCA, the Roman Period and ca. 3 ka BP.

The preliminary data from Arxuri and Marboré suggest a similar trend than in the western Mediterranean: and Early Holocene stability and an increase of Saharan dust loading after the end of the African Humid Period (ca 7 to 4.5 kyr BP) and higher dust input during warmer and more arid periods. The relationship between warmer periods and higher dust input from Saharan sources will be explored with isotope geochemistry.

The incorporation of isotope proxies in the both sequences to better identify dusty periods, and the investigation of other sequences in Central and Eastern Pyrenees, the Balearic Islands and the Sierra Nevada mountain range will allow us to draw a full picture of Holocene Saharan dust outbreaks affecting the Western Mediterranean.

**Acknowledgements:** This study was funded by research project POSAHPI (Agencia Estatal de Investigación, PID2019-108101RB-I00).