COSMOGENIC RECORD OF THE EVOLUTION OF TROPICAL GLACIERS IN THE PITICOCHA VALLEY – PARIAQAQA MOUNTAIN RANGE (LIMA - PERU)

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ABSTRACT

The Piticocha Valley is located on the southwest side of Pariaqaqa Peak (11 ° 59'39.53 "S; 75 ° 59'35.74" W; 5758 m.s.n.m) in the Western Central Andes. 35 samples of moraines blocks and rock beds were obtained, to be dated by cosmogenic isotopes. Surface exposure ages based on the in-situ accumulation of Beryllium-10 isotopes were obtained from twenty moraines blocks and four polished rock beds and for the case of accumulation of Chlorine-36 isotopes were obtained from eight samples of moraines blocks and three polished rock beds. The main objective of cosmogenic dating is to investigate the different advances and setbacks that glaciers experienced from the Last Local Glacial Maximum to the most recent advances registered in the valley. The ages obtained propose three groups of moraines that are deposited along the valley. The oldest group of moraines is contemporary to the Last Global Glacial Maximum and is located on both banks at the end of the valley. Subsequently, the Piticocha valley glaciers endured minor pulsations far from their maximum position dating between 11 and 13 ka, which is attributed to the period known as the Younger Dryas in the northern hemisphere. This indicates that the glacier experienced an extensive deglaciation period between the LGM and the YD. Finally, the most recent ages correspond to moraines found at the head of the valley and very close to the current position of the glaciers. Probably, this was the last pulsation that the ice masses experienced in the vast valley of Piticocha. The cosmogenic record for the moraines of this last glacial advance, coincides chronologically with advances occurred during the period known worldwide as the Little Ice Age, which is recorded in greater detail in the northern hemisphere.

Keywords: Younger Dryas, Last Glacial Maximum, Little Ice Age, Geomorphology, beryllium isotopes, chlorine isotopes