



DEGLACIATION OF THE CORDILLERA BLANCA (PERÚ) THROUGH THE SCHMIDT HAMMER EXPOSURE DATING (SHED)

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This study presents the first results on the deglaciation of the Cordillera Blanca (Perú), concretely in the Nevado Hualcán (9°12' S; -77°31' W; 6122 m), through the Schmidt Hammer Exposure Dating (SHED).

Taking as reference geomorphological mapping in detail and chronology (TCN dating) of the glacial forms of the Valley Hualcán, (Úbeda et al., 2019), during the month of July 2018, 67 samples from of moraine boulders granodioritic lithology were taken under the same environmental conditions. In this work, we consider as valid the average value and the standard deviation of 30 impacts for each sampled site.

The most recent moraines M1-LIA are located delimiting the Laguna 513 (4460 m) and the Laguna Rajupakina (4100 m) which give values between $R=62.7\pm 1.7$ and $R=70.3\pm 1.5$ respectively. The M2-YD have multiple ridges: the most external (3752-3635 m) $R= 54.3\pm 2.2$; the largest ridges $R= 54.3\pm 2.2$; and a frontal ridge over the current pampa (3624-3617 m) $R= 58.2\pm 2.5$. The M3-OD shows clearly a right moraine ridge that delimits the Sonquil pampa (3685-3643 m) $R=48.8\pm 1.8$. The M4-LGM delimits the current valley and forms several ridge moraines of great dimensions: the most external (3704-3603 m) $R= 41.0\pm 1.9$; the most internal (3629-3574 m) $R=47.1\pm 1.7$. Lastely, the M5-LGC two formations have been identified: the lowest lateral ridge is located in the Valley of Hualcán (3396-3283 m) $R= 43,8\pm 2,0$; and a series of marginal ridges to the current valley (3901-3859 m) $R= 44.6\pm 2.2$.

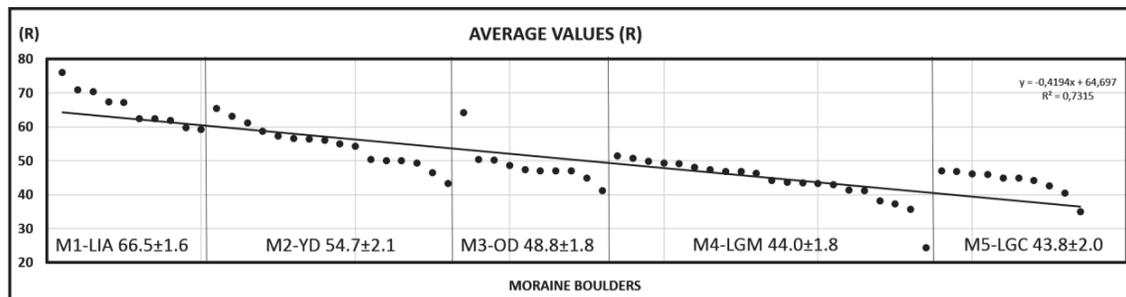


Figure 1 shows the average values (R) of each moraine boulder through the different glacial phases. The results obtained show a clear relationship between the different glacial phases and the impact-rebound SHED values. There is a clear gradation of the highest values (most modern phases) to the lowest values (oldest phases). The most modern formation M1 gives an average value of impact-rebound $R>60$, the M2 $60>R>50$, the M3 $50>R>45$ and the M4-M5 $R<45$.

This method (SHED) is very useful in indicating similar glacial evolution to Cordillera Blanca, where absolute dating is very scarce. In addition, new data collection will allow for a better statistical correlation with absolute dating (TCN), as has been done in other regions (Tomkins et al., 2018).

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