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EARLY MIOCENE CLIMATE ESTIMATIONS IN PATAGONIA: THE CASE OF PICO QUEMADO, ÑIRIHUAU FORMATION (EARLY-MIDDLE MIOCENE)

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Abstract

The climate during the early Neogene in Patagonia is characterized by the increase of the average temperatures until the mid-Miocene Climatic Optimum. However, the terrestrial paleoclimate of southern South America during this period is unclear. Therefore, a physiognomic analysis on the Pico Quemado (Ñirihuau Formation, lower-middle Miocene) megaflora was realized. Three types of analyses were performed: 1) Leaf Margin Analysis (LMA); 2) Leaf Area Analysis (LAA); and 3) a CLAMP analysis (Climate Leaf Analysis Multivariate Program) with two different dataset. The LMA and CLAMP predicted an estimated a Mean Annual Temperature of 10.4±2.1°C, 8.5±2.1°C and 7.2±1.4 respectively. The estimations of Mean Annual Precipitation were of 123.7±21.2 cm. Through the CCA, other parameters were estimated, i. e. Cold Mean Month Temperature (-3.3±3.8°C, 1.6±1.6°C); Warm Mean Month Temperature (17.4±3.3°C; 14.1±1.2°C); Mean Growing Season Precipitation (121.9±42.6 cm.; 78.1±42.6 cm.); Precipitation of the Three Consecutive Wettest Months (116.2±15.3 cm.; 88.5±15.3 cm.); and Precipitation of the Three Consecutive Driest Months (40.2±19.8cm.; 54.1±19.8 cm.). From these results, the Pico Quemado megaflora can be characterized as having a cool temperate climate, with moderate precipitations and the