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# Evidence for a Younger Dryas glacial advance in the Andes of northwestern Venezuela

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**Abstract**

Deposits of push moraine, outwash and glaciolacustrine sediments, recovered from two areas in the northwestern Venezuelan Andes document the latest Pleistocene advance of Mérida ice. Underlying peats provide maximum ages on till and outwash evidently emplaced during the Younger Dryas (YD) climatic event. One example recovered from the Humboldt Massif, where the farthest extent of YD ice buried peat in the surface of Late Glacial till, provides a within-glacier advance age of 12.4 ka cal BP. The peat lies on moraine deposited during a stillstand event when the Humboldt Glacier retreated to the area of Lago Verde at ~4000 m a.s.l. Approximately 0.5 km upvalley, toward Lago Suero, YD till buries peat deposited in glaciolacustrine sediments of presumed Late Glacial age. Farther north, in the Mucuñuque–Mucubají Catchment of the eastern cordillera, a push moraine of possible YD age buries older till of Late Glacial age; ~0.2 km upvalley, outwash of YD age buries glaciolacustrine peat and organic-rich alluvial sediment dated to 13.7 and 13.3 ka cal BP. The latest Mérida advance documented here is approximately synchronous with the YD cold event of Europe and the North Atlantic Region (ca. 11.6–12.7 ka cal BP). The YD event in both areas of the northwestern Venezuelan Andes nearly reestablished earlier Late Glacial ice positions, and termination appears to have been abrupt; the valleys in both areas were evacuated of YD ice without emplacement of recessional moraines as during the main deglaciation. At the Humboldt site, equilibrium line altitudes (ELA's) for the Late Glacial were about 50 m lower than during the inferred YD; in the Mucuñuque–Mucubají catchment, ELA's for the Late Glacial (~3900 m a.s.l.) are difficult to establish given the absence of lateral moraines.


*Keywords:* Younger Dryas; Glacial advance; Geochronology; Radiocarbon dating; Microbial contamination

## 1. Introduction

The high summits of the eastern cordillera of the Venezuelan Andes lie between 8°30′ and 9°00′ N and 70°30′ and 70°45′ W, at elevations close to 5000 m a.s.l. Along a NE to SW trending drainage divide, ice spilled to

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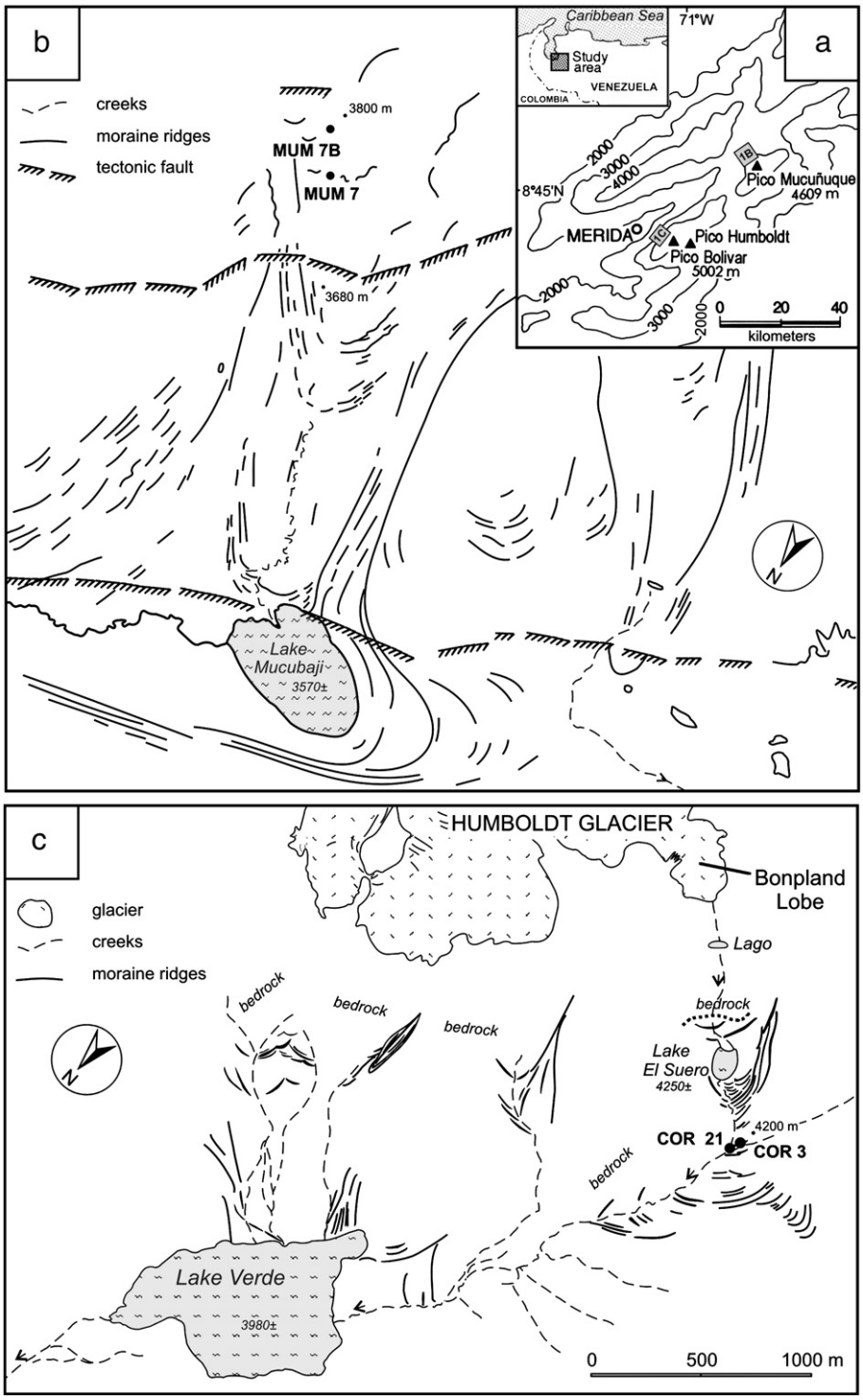


Fig. 1. (a) Topographic map showing the relative locations of Pico Humboldt and Pico Mucuñuque in the Eastern Mérida Andes; (b) Mucuñuque Valley showing the location of sites MUM7 and 7B; (c) Humboldt Massif showing the location of COR21.