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U-Pb ages of detrital zircons and Palynology of the Silurian Cancañiri Formation from the Bolivian Altiplano

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1 Introduction

Samples from the Lower Paleozoic Cancañiri Formation at la Cumbre, La Paz-Bolivia (Andes Centrales), were analysed for petrography, geochemistry, dating of detrital zircons and palynology. This unit was interpreted as recycled from previous glacigenic deposits (Díaz-Martínez, 1997, 2005) probably from the latest Ashgilian to the early Llandoverian. The aim of our study is to reveal more information about the depositional setting of the succession often interpreted as one of the most significant rock section containing lithological constraints for the Hirnantian ice age in western South America.

2 Results

First results of U-Pb ages of detrital zircons (n= 93 < 10% discordance) do not reveal the maximum depositional age as the so far dated sample is affected by sorting. The youngest zircons are of Ediacaran age and are the most abundant group. Cryogenian zircons are less abundant alike Late Mesoproterozoic ones. A significant population (c. 10%) is of Paleoproterozoic (1.9-2.1 Ga) age. Although the rocks are dark to even black the content of organic carbon is minute (< 0.05 %). Trace element geochemistry point to a possible anoxic depositional environment based on a slight enrichment of some redox-sensitive base metals (Cr, Ni, V) but increased Mo, Hg and Cd concentrations are absent and U/Th ratios are mostly below 0.3. Hence, the geochemical results do not support an anoxic depositional environment. From sixteen samples processed for palynology, six yielded acritarchs (40 species), chitinozoans (14 species), cryptospores (10 species), chlorophycean algae (*Quadrisporites* sp.), and scolecodonts (2 species), poorly preserved and with high thermal maturation (grey to black colour, TAI 3+ to 4). The biostratigraphic analysis of the species revealed three groups, one of autochthonous species from the Silurian (cryptospores *Imperfectotriletes vardovae,* acritarchs *Ammonidium ?cladum, Baiomeniscus camerus, Cymatiosphaera* cf. *franjada, Domasia limaciformis, Eupoikilofusa striatifera, Fractoricornula* sp., *Helosphaeridium citrinipeltatum, Leiofusa cucumis, Leiofusa thomissa, Leiofusa parvitatis, Leiofusa* cf. *estrecha, Neoveryhachium carminae, Onondagaella* sp., *Veryhachium strangulatum,* chitinozoans *Cyathochitina* sp. B sensu Paris, *Cyathochitina campanulaeformis, Conochitina elongata, Conochitina* cf. *armillata, Desmochitina acollare, Sphaerochitina* sp. C Grahn et al.), others from the Ordovician (*Acanthodiacrodium crassus, Orthosphaeridium* spp., *Vulcanisphaera tuberata, Focusphaera elongata, Lagenochitina cilindrica, Lagenochitina baltica, Lagenochitina obeligis*), and a third one with long stratigraphic range from Ordovician to younger ages (*Leiofusa tumida, Polygonium gracile, Veryhachium trispinosum, V. downiei, Villosacapsula irrorata*). The autochthonous species suggest for this unit an Aeronian (middle Llandovery) to Telychian (late Llandovery).

3 Preliminary results

A correlation with other Early Silurian units such as the Lipeón, Zapla and Cachipunco formations in northwest, Los Espejos Formation of Central Argentina, and the Vargas Peña Formation from Paraguay and the Vila María Formation in southern Brazil (Argentina (Rubinstein and Vaccari, 2004; Grahn 2005; Rubinstein, 2005; Inunciaga and Gutiérrez, 2011; Rubinstein, 2013), is supported on the basis of common species (cryptospores *Imperfectotriletes vardovae,* chitinozoans *Conochitina elongata, Conochitina* cf. *armillata, Cyathochitina campanulaeformis, Sphaerochitina* sp. C Grahn et al., acritarchs *Baiomeniscus camerus, Fractoricornula* sp., *Neoverhyachium carminae, Onondagaella* sp.). Based on the here shown data the formation would be younger than the Hirnantian.

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