Palynology and detrital zircons of the Silurian Cancañiri Formation from the Bolivian Altiplano

Udo Zimmermann[1], Shirley Lopez[2], Mercedes di Pasquo[3], Tom Andersen[4], Sveinung Hatløy[1], Trine Mehus[1], Caroline Ruud[1], Siri L. Simonsen[4]

[1]Department of Petroleum Engineering, University of Stavanger, 4036 Stavanger, Norway; udo.zimmermann@uis.no; [2]Universidad Mayor de San Andrés, POB9087, shirlop_v@yahoo.com; [3]Laboratorio de Palinoestratigrafía y Paleobotánica, CICYTTP-CONICET. Matteri y España s/n, E3105BWA Diamante, Entre Ríos, Argentina; medipa@cicyttp.org.ar; [4]Department of Geosciences, University of Oslo, N-0316 Oslo, Norway; t.h.andersen@geo.uio.no

Samples from the Lower Paleozoic Cancañiri Formation at la Cumbre (La Paz-Bolivia), were analysed for petrography, geochemistry, dating of detrital zircons and palynology. This unit was interpreted as recycled from previous glaciogenic deposits probably from the latest Ashgilian and the early Llandoverian. 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. 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 does not support an anoxic glacial depositional environment with only slight enrichment of some redox-sensitive base metals (Cr, Ni, V), which also could be related to provenance. 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). A correlation with other Early Silurian units such as the Lipeón, Zapla and Cachipunco formations in northwestern Argentina, Los Espejos Formation of Central Argentina, and the Vargas Peña Formation from Paraguay, and the Vila María Formation in southern Brazil, 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.).