*German Partners*

Considering the German cooperation partners the following is suggested: Helmholtz Center for Environmental Research (UFZ) Leipzig and the Technical University of Dresden (TU Dresden) as coordinating cooperation partner for the joint project. Related participating institutions are KIT (Karlsruhe Institute of Technology), the Universität der Bundeswehr – München and the water supply company



## Does Chilenia exist? Evidence from the evolution of collisional and coastal accretionary systems between the latitudes 30°S and 35°S

Willner AP 1,2, Massonne H-J 2, Gerdes A 3 , Hervé F 4, Sudo M 5, Thomson S 6

*1 Inst. Geologie, Mineralogie, Geophysik, Ruhr-Universität Bochum, Germanyy ane.willner@rub.de*
*2 Institut für Mineralogie und Kristallchemie, Universität Stuttgart, Germany*
*3 Institut für Geowissenschaften, Mineralogie, J.W.Goethe Universität Frankfurt, Germany*
*4 Departamento de Geología, Universidad de Chile, Santiago de Chile, Chile*
*5 Institut für Geowissenschaften, Universität Potsdam, Germany*
*6 Department of Geology and Geophysics, Yale University, New Haven, CT, USA*

Within the basement close to the western continental margin of South America between the latitudes 30°S and 35°S the occurrence of a separate microplate, accreted to South America in Late Palaeozoic times, has been proposed by Ramos et al. (1984). These authors called the microplate/terrane Chilenia. However, it is not exposed at the surface because of the extensive cover by younger sediments and volcanics. Evidence for the existence of Chilenia can be derived by unravelling the evolution of two contrasting accretionary systems on both sides of the proposed terrane: (1) the Palaeozoic collisional accretionary prism of the Guarguaraz Complex at the suture between the Cuyania and Chilenia microplates in western Argentina (longitude 69°W) and (2) the late Palaeozoic coastal accretionary complex within the Coastal Cordillera of central Chile (longitude 72°W). Both complexes are composed of continent-derived metasediments including up to 10-15% intercalations of disrupted oceanic crust and were subjected to high-pressure metamorphism.

According to the age spectrum of detrital zircon, the maximum sedimentation age of the metasediments of the Guarguaraz Complex is about 563 Ma (Willner et al., 2008). Their peak PT-conditions were 13-14 kbar at about 500°C (Massonne and Calderón, 2008), which represent a metamorphic geotherm of close to 10°C/km during this metamorphic stage. A decompresion path to midcrustal conditions at 8 kbar and 600°C was further derived. So far, such decompression-heating paths are only known from continent-continent collisional settings. Ages

for the peak of metamorphism (Lu/Hf system) are currently under investigation, cooling ages for the Guarguaraz Complex are at 323Ma (Ar/Ar) and 284-295Ma (zircon fission track).

In the coastal accretionary complex, accretion started before 320Ma with frontal accretion in upper levels leading to metamorphic conditions of 4-6 kbar, 250-300°C (Willner et al. 2009) after a short period of stable continental margin conditions (western margin of Chilenia). The corresponding geotherms are relatively high. Chevron folds of bedding planes and reverse faults were formed, indicative of subhorizontal shortening (Richter et al., 2007). Subhorizontal flow paths at maximum depth are proved by a near-isobaric prograde PT-path. At the same time, material more deeply transported into a subduction channel was heated against a still hot mantle at 12-14 kbar, 600-700°C and subsequently cooled at depth following an anticlockwise PT-path (Willner et al., 2004). Upwards directed forced flow is the predominant process in a subduction channel, but only little material of the subduction channel seems to have been incorporated into the accretionary prism itself.

At ~308 Ma the accretion mode changed from frontal to basal accretion leading to peak PT conditions of 7-10 kbar, 350-400°C (Willner et al., 2005). Maximum sedimentation ages and the ages of the peak of metamorphism are systematically younger in the basal accretionary prism (311 Ma and 279-308 Ma, respectively) than in the frontal accretionary systems (338-345 Ma, > 320 Ma). Deformation after accretion is characterized by pronounced flattening resulting in a penetrative subhorizontal transposition foliation by pressure solution processes (Richter et al., 2007). Static recrystallisation outlasted deformation during decompression with slight cooling. Erosion at an axial rise of the accretionary wedge balanced accretion at depth leading to recycling of material to the trench as well as filling of retrowedge basins. Accretion ended after about 100 Ma of duration (Willner et al., 2005).

The contrasting evolution of the collisional and coastal accretionary systems indicates collision of the Chilenia Terrane, presumably in Late Devonian-Early Carboniferous times, before the onset of accretion processes along the Palaeopacific coast. Chilenia formed the back-stop system of the extensive Late Palaeozoic coastal accretionary system and was first covered by sediments of a wide Late Carboniferous retrowedge basin that also received detritus from the rising collisional belt (Guarguaraz Complex) and an Early Carboniferous magmatic arc (Willner et al., 2008).

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## Transferencia colombiana de conocimientos y experiencias de producción limpia en el beneficio de minerales auro-argentíferos

Wolff Carreño E

*Proyecto Río Suratá – Convenio CDMB – BGR, erwin.wolf@cdmb.gov.co*

Desde 1997 se ha venido desarrollando el Proyecto "Reducción de la Contaminación Ambiental Debida a la Pequeña Minería en la Cuenca del Río Suratá (Proyecto Río Suratá)" en el marco de la Cooperación Técnica Colombo Alemana, cuyos ejecutores han sido por Colombia la Corporación Autónoma Regional para la Defensa de la Meseta de Bucaramanga (CDMB) y por Alemania el Instituto Federal de Geociencias y Recursos Naturales (BGR) con el fin de aplicar procesos limpios y buenas prácticas ambientales sostenibles para el manejo del mercurio y del cianuro utilizado por la actividad minera auro-argentífera de pequeña escala en los municipios de Vetas y California (Departamento de Santander, Colombia).

El desarrollo de este Proyecto ha demostrado reducción de contaminación en forma económicamente sostenible, pues la recuperación del metal valioso ha sido mayor, según los datos recopilados a diciembre 31 de 2007 para las unidades productivas intervenidas en promedio: Reducción del uso de mercurio en 82%; disminución del consumo de cianuro en 36%, e incremento de productividad en 79%.

En virtud de los resultados exitosos alcanzados por este proyecto, a partir del año 2005 otras instituciones ambientales colombianas que sufren problemas de